Industrial FINISHING

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Letters from Readers

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

Float Pearl (Dipping)

We are very much interested in item No. 183 in the New Materials section of the January 1940 issue of INDUSTRIAL FINISHING (page 56). Will you please arrange to have the manufacturer send us pertinent literature and samples?—R. Pencil Co.

It's Mearl Corp., New York City.—ED.

Solvents Recovery Service

Will you kindly advise whether there is any solvent recovery service within easy shipping distance of Pittsburgh, Penna.? We refer particularly to the article on page 42 of June 1940 issue.

If there is no solvent recovery service near here, would you please put us in touch with the manufacturers of solvent recovery equipment?—O. Co. (Industrial and Technical Paints).

The company that the author of the article is connected with, is located at Newark, N. J., see their advertisement in May issue, page 70. —ED.

Preservative Sealer for Pine and Cypress

We desire information about materials for preserving and sealing Ponderosa pine, yellow pine and cypress, used in the manufacture of window frames and sash. We understand that such a product is manufactured under the name of "Woodlife", but we do not know the name of the manufacturer of this material. If you can give us any information in regard to this matter, we will appreciate your doing so.—A. J. Co. (Fine Cabinet Work).

We are submitting names of manufacturers of wood preservative sealers. Regarding the product called "Woodlife", we notice in the Trademark Directory of the National Paint, Varnish and Lacquer Assn., Inc., that a material by this name (listed as stain) is made by John McQuade & Co., Inc., Brooklyn, N. Y. We have no knowledge of the merits of this particular product.—ED.

Compo Board Sealer

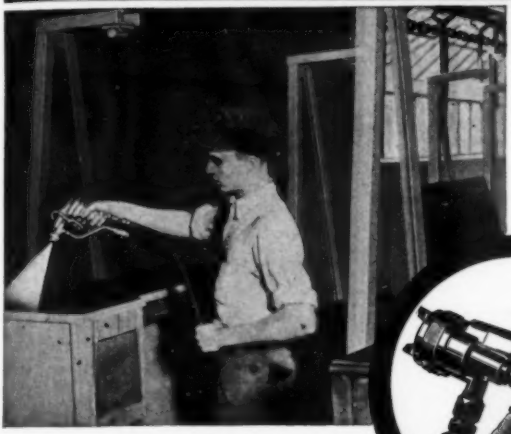
On page 7 of the January issue of your magazine you have an article in reference to a sealer for compo board made by the Chadakoin Chemical Co. . . . We would like to have the name and address of the manufacturer of this material.—F. W. (Toys, Games, Novelties).

The company is located in Jamestown, N. Y., at 559 Buffalo St.—ED.

Flock Finish

We are advised that you would be able to furnish us the addresses of several concerns who could supply the various materials required for paint process lettering, and also flock lettering. We presume that you are familiar with lettering of this type, and we would greatly ap-

COMPARE RESULTS
on your product..on your cost records!



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PRIMER

For streamline speed

- Air dries in 20 min.—Can be force-dried or baked.
- Forms perfect bond for lacquers or synthetics—no lifting.
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- Resists moisture penetration and salt spray tests.
- Supplied in different colors to suit your needs.

Will Finish Your Product or Supply Sample for Your Tests.

H. V. WALKER CO.

MODERN PRODUCTION FINISHES

Elizabeth, New Jersey

preciate it if you would furnish us with the addresses of several concerns so that we could contact them.

For your further information, we manufacture a line of athletic clothing which we desire to finish with both lettering and emblems in processing.—M. C. Co.

Names and addresses of manufacturers of silk-screen equipment, supplies and process paints have been supplied by letter; also, manufacturers of flock material and flock spraying equipment.—ED.

Paint Paddles

Referring to the letter entitled "Painters' Free Supplies," page 7, May 1940 issue, wherein a concern wants to buy paint paddles, we are interested in this request. We manufacture paint paddles on a very large scale and would thank you to notify the concern who made the inquiry.—A. B. Co. (Cigar Boxes).

Burnished Gold

We wish to develop the best possible finish in gold and silver leaf and powders, burnished — a finish that will stand some wear for furniture on table tops, chair arms, etc. We will thank you for any information you can give us along this line as to where we can secure the best materials, tools, agate burnishers, etc.; also, would like to get a good book for the study of this class of work.—C. R. Co. (Wood, Metalcraft and Finishing).

Spreader Type Finishing Machine

We are interested in coating table tops with a spreader-type finishing machine. Would you kindly give us the names of several manufacturers that sell machines of this type?—I. B. Co.

We presume you mean so-called roller-coating machines, and are sending you the names and addresses of several manufacturers.—ED.

Lacquer for Combs

We are wondering if you know of any firm that has a clear or transparent lacquer to use as a coat on cellulose acetate pocket combs? The lacquer we have been using seems to draw the plasticizer out of the material, preventing the comb from drying. We are wondering if you

Doing any bleaching? **TRY**

Du-Bar

AMERICA'S FINEST BLEACH

Single Application! Powerful!
Odorless! Positive!
No residue! GUARANTEED!

V. J. DOLAN & CO., INC.

"Unquestionable Quality" Industrial Finishes

1838 NORTH LARAMIE AVENUE CHICAGO, ILLINOIS

could help us?—L. P. Co. (Fine Writing Instruments Since 1863).

We are submitting names of a few lacquer manufacturers near your locality.—ED.

Infra-Red-Ray Tunnels

On page 47 of June 1940 INDUSTRIAL FINISHING magazine, you show a flexible tunnel section for infra-red-ray drying. Who manufactures this equipment?—B. T. Co.

Try our advertiser on page 77 of that same issue—Infra-Red-Ray Devices, Inc.—ED.

Marbleized Finishes

In your May issue, page 10, E. Casket Co., requests information on marbleized finishes. We are the originators of this finsh and have supplied it for a number of different purposes. We are at present supplying several casket and grave-vault manufacturers with this finish. If you will have the inquiry referred to us, we will be glad to take the matter up direct.—Rockford Varnish Co.

Burning-in Knives Silver on Glass

Will you be kind enough to give us the name and address of the N. L. Co., who is interested in burning-in knives; see page 8 of June issue?

Can you also give us some information regarding "Silver on Glass", which was inquired about on page 4? —Universal Shellac Stick Co., Inc.

We are sending you the full name and address of N. L. Co., who, by the way, were referred to you when their inquiry first came in.

For information about "Silver on Glass", we are referring you to several manufacturers of finishing materials.—ED.

Flocked Screens Found

Kindly send us the name of the manufacturer who asks for a supplier of flocked metal screen, as published on page 7 of June issue of INDUSTRIAL FINISHING.

We are sending you a small sample book and a piece of Pliosuede which is flocked Pliofilm. May we call your attention to the fact that we flock almost any kind of material that can be flocked in volume, so on

any future inquiries that you may have, if you will keep us in mind we will appreciate it.—Cellusuede Products, Inc.

We are placing your name and address on file.—ED.

Custom Finishing

We note with interest the question and answer in your June issue headed, "Cost of Custom Finishing" (pages 52-56). This is our particular line of work and we feel we can be of real assistance to this firm. We would appreciate your addressing the enclosed envelope to them. — The Spray-Rite Co.

Conveyor Job

On page 12, of the May 1940 issue of INDUSTRIAL FINISHING, there is an article, "Conveyorized Finishing of Structural Steel Frames," by C. D. Paquette, describing a conveyor system for handling load bars longitudinally on a chain conveyor and the mechanism for transferring the load bars to a transverse conveyor for handling through the finishing and baking operations.

We shall be pleased to have you let us know the name of the conveyor supplier for this installation, so that we may contact them, as we have a job of a similar nature under consideration.—E. W. Co. (Electrical Equipment).

The concern that supplied this conveyor equipment is International Conveyor and Washer Corp., Detroit, Mich.—ED.

Offer 10-cent Paints

In the June 1940 issue of INDUSTRIAL FINISHING magazine, on page 9, there is a sales organization identified as the P. S. Co., inquiring about a 10c line of paint. Kindly submit our name as manufacturer to this company; we would like to get in touch with them.—The Premier Chemical Corp.

In this month's issue of INDUSTRIAL FINISHING we note that a West Coast organization, "P. S. Co." is interested in a distributing proposition on 10c paints. We would like to get in touch with this company regarding our line of merchandise and

UNI-TUFF Wrinkle

For a Perfect Finish!

WILL BAKE AT HY AND LO TEMPERATURE—400° ½ HR.—150° 3 HRS.

Dependable Performance!

Tough and Elastic Finish—withstand use and abuse. All type wrinkles.

Adaptable to any product. Better adhesion and mileage. Unusual marproofness.

FORMULATED TO MEET YOUR EXACT REQUIREMENTS

Further information and samples will be gladly furnished on request.

LACQUERS THINNERS ENAMELS METALIZED FINISHES SYNTHETICS

UNITED LACQUER MFG. CORP.

General Offices and Factory: Linden, New Jersey

would appreciate the firm's name and address.—Star Bronze Co.

. . . . We manufacture this type of product and if you will be kind enough to furnish me with the name and address of these people, I will be glad to get in touch with them. If you like, you may advise them our name and address and they can, if interested, write us.—The A. Wilhelm Co.

Thank you for your prompt response. Name and address of company is being sent to you by letter. —Ed.

White to Stand Heat

Can you give us the manufacturers' name and address of a satisfactory white enamel that can be used for spraying? Same must be suitable for spraying on metal that is subjected to heat. If there is not a satisfactory white enamel that will withstand the heat, what, if any, enamel is there of a light color or near white? This material would be used for spraying the bodies of our oil-burning ranges. —T. Iron Works.

Several advertisers in this magazine can supply what you want. Suggestions are going forward by mail.—Ed.

Acetate Sheets

Can you advise where we may get information regarding Acetate Sheets?—I. A. Co. (New and Unusual Finishes).

Multiple Striping

We will appreciate very much if you will give us the names of the manufacturers of multiple striping equipment and tools to produce multiple stripes in one operation. This is in reference to the inquiry on page 4 of the April 1940 issue of Industrial Finishing.—D. E. Co. (Air Conditioning Equipment).

Names and addresses of manufacturers have been given.—Ed.

Lacquer Film Graining

In the article, "Styles, Finishes and Colors for 1940 Furniture," beginning on page 10 in February 1940 issue, you refer to a solidified lacquer film printed on the back with a pattern and sold in sheets for application to

FORM - A - ROC

We offer to all industries equipped for baking finishes this highly perfected, heat-converting, synthetic enamel.

FORM - A - ROC

We have combined to an optimum degree the necessary qualities of tremendous hardness, great adhesion, smooth lustrous gloss, and freedom from haze, discoloration and wrinkling.

FORM - A - ROC

Baking schedule is of great flexibility, permitting from 5 - 50 minutes at 250 - 375° F.

FORM - A - ROC

No matter which of the present worthy finishes of this type you may be using or planning to use we sincerely recommend that you investigate

FORM - A - ROC

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THE VARNISH PRODUCTS CO.

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CLEVELAND, O.

Mechanical Sanding

Cuts Costs

Hand sanding is costly, slow and tedious. Modern plants have discarded this old-fashioned method and now use

STERLING *Speed-Bloc* SANDER

It is faster, easier, cheaper. It produces 3,000 oscillations per minute—workmen simply guide it. Effective on curved or flat surfaces. You can reduce labor and material costs as much as 75%. Adopted by leading plants over the country. Arrange for demonstration in your own plant.

Often pays for itself the first few weeks.

Sterling Products Co.

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DETROIT, MICH.

3380 ROBERTSON BLVD.
LOS ANGELES, CALIF.

various materials including Masonite. What manufacturer may we contact for information on this new item?—B. Casket Co.

The manufacturer of this graining process is The Di-Noc Mfg. Co., 1700 London Road, Cleveland, Ohio. Their advertisement appears on page 57 of that same issue.—ED.

Crackle Lacquer

Please advise us where we may obtain crackle lacquer. We have been using the ——— Co.'s crackle lacquer but understand they have discontinued its manufacture. Your early reply will be appreciated.—L. M.

Marble Grit

In the May issue of INDUSTRIAL FINISHING, an article appeared under the title of "Custom Metal Finishing," by W. K. Perdue, on paint and marble grit finishes. We would appreciate your advising us where the marble grit can be purchased.—J. S.

Flo-Coating

We believe that in previous issues of INDUSTRIAL FINISHING there have been articles on Flo-coating of materials. We are not keeping a file of these various magazines [you should keep them.—Ed.] but would appreciate it if you could send us cuttings from the various magazines or the entire issues in which this subject is discussed, for we are most anxious to obtain all possible information on this method of applying paint materials.—R. Mfg. Co. (Metal Furniture Since '97).

Information supplied—ED.

Whirling Enameler

We have noticed some advertisements in your magazine, from time to time, and at this moment we are interested in finding out where we could purchase a whirling enameler. We have seen this advertised in your magazine, but don't seem to be able to locate it in the few copies that we have left. This machine, to the best of our memory, operates a great deal like a cream separator.—M. Co. (Metal Windows).

Information supplied.—ED.

(Continued on page 76)

Think

. . . how important it is that your product should look right when Mrs. Public first casts her eye on it.

87% IS SEEING

87% of the first impression is seeing, and the buyer is impressed by what she sees.

The right finish for the product is therefore more important than any other single factor in the sale.

Stille-Young finishes are important to you.

Your inquiry will receive immediate attention.

THE STILLE-YOUNG CORPORATION
Manufacturers
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S-Y

LACQUERS
SEALERS
STAINS
ENAMELS
FILLERS

Processing and Finishing

MANY practical designs are included in the make-up of the modern refrigerator cabinet but it is well understood that the whiter the refrigerator can be made, the more appealing it seems to be to the purchasing public. Colors have been introduced, particularly in trimmings, but they have not met with great favor by the buyers. For this reason I will confine this article to refrigerator cabinets finished in baked white enamel.

BY J. O. JUDD
Chief Chemist

Cold-rolled steel, ranging between 18 and 22-gauge, is the ordinary stock used in the construction of the panel parts of a refrigerator. This steel is received in various sizes. It is sheared to the required dimensions, screw holes and openings of different sizes are blanked out, and enormous presses are used to draw these metal parts into the various required shapes.

Hot-water-soluble drawing compounds are generally preferred, both for the minimum of wear inflicted on the dies and the easy removal of the compound from the metal. Paraffin oils and petroleum greases are difficult to remove afterward. But petroleums often work so well that sometimes it is absolutely necessary to use them in order to protect the draw on the metal and to prevent wearing action on the dies.

Various sizes and shapes of this sheet steel move into the welding department. Welding can be done so expertly with spot-welding and seam-welding machines that the joints are scarcely noticeable, yet upon completeion these joints have strength equal to the uncut metal. Metal smoothing is an operation performed either between certain welding operations or immediately after all welding work has been completed. Portable abrasive wheels, both disc and cylindrical, are used in this metal smoothing work. Skillful grinding is necessary to avoid making deep scratch marks which would show through after the surface had been painted, regardless of the type of enamel used or the number of coats applied.

Cleaning Off Oils and Drawing Compounds

Before any coatings are applied the metal must be clean, and for this reason the oils and drawing compounds that have been used to bring the metal to its present form play an important role in the final result and durability of the finished product. A solvent vapor-degreaser is effective for cleaning drawing compounds and other foreign matter from metal to be rust-proofed and enameled. Kerosene and phenol emulsions are used sometimes, but they are difficult to control. Water softeners are often used, but al-

Refrigerator Cabinets

PART I

Waterfall pressure spray booth. Photo., courtesy of Hoosier Lamp & Stamping Corp.

kali cleaners are generally employed because of their economy. Difficulty is often encountered in using alkalis and sometimes it is hard to trace the source of trouble owing to the number of oils that may have been used in the drawing compounds. They may be partly or wholly saponified by the use of alkali.

I have endeavored to point out the necessity of controlling drawing compounds to the hot-water-soluble type, as these will rinse

free and clean in hot water alone. It may be necessary to break such compounds with an alcohol or kerosene wipe before the metal enters the hot-water wash. This is controlled solely by the length of time that has elapsed between application of the drawing compound and the removal of same. Usually, and with great effectiveness, the hot water wash is run in three stages and is operated at a temperature of about 180°F. After passing through the third wash, the metal should be thoroughly clean and able to stand a water-break test.

Phosphate Coating

With the metal properly cleaned, it is ready to enter the so-called phosphate coating, of which there are now on the market more than one that will prove effective. They may be purchased in strengths suitable for either hot or cold application methods.

If the ultimate buyers of refrigerators realized the value of phosphate coating to metal before the paint is put on, manufacturers would find them insisting upon its application. Regardless of the quality of the paint primer, intermediate coat or finish coat, everything depends upon the adhesion of the prime coat to the metal surface.

The hot-application process of phosphate coating is operated at a given strength at approximately 175°F. A slightly lower temperature may be used, but cost will go up and efficiency will go down somewhat. The heat carried over from the hot-water rinses will help control this temperature, as well as the room atmosphere.

The cold-application process has a much wider range of temperatures that will allow both economy and quality and will operate efficiently at approximately 90°F. A cold-water rinse follows the phosphate application; this will operate at a temperature more or less controlled by room heat and the carry-over.

Chromic-Acid Wash

A chromic-acid wash is the next step. It sets the phosphate and, to a certain extent, washes off and dissolves the microscopic fuzzy ends of the coating. Drying the metal as soon as possible after the chromic-acid wash is essential in order to prevent any possibility of chromic-acid staining. The entire set-up so far described is effective, especially if everything is conveyorized.

Proper spacing between tanks is necessary to prevent oxidation. Attention must be given to the complete drainage of parts between one operation and the one following, in order to exclude all carry-over of solution. The metal parts in process should not be finger-printed nor touched with anything that will contaminate their surfaces. Any necessary manual handling, such as transferring from one place to another, should be performed by workmen wearing clean cotton gloves. Finger-printed test panels that have been finished and then placed in the humidity cabinet or humidity room will show finish failures much more quickly than those that have been untouched by human hands, especially perspiring hands; in fact, the finish failure occurs in about one-third of the time that a good panel resists finish failure.

The value of a finished panel that has been treated and phos-

phated in the manner I have mentioned will be realized if such a panel is scratched or cut deeply—entirely through the finish so the bright metal may be seen through the cut. Place this panel in the humidity cabinet (operated at approximately 100% humidity and 100° to 110°F.) beside a panel that has been finished in the same manner and scratched in the same way, but minus the phosphate coating. Oxidation naturally starts immediately in the cut. If these two panels are left in the humidity cabinet long enough, the oxidation crawl will detach the paint completely from the unphosphated panel; whereas, on the phosphated panel, the surface will not be affected except close to the scratch. The oxidation crawl will extend no more than 3/16 to ¼-in. from the scratch.

Tack Ragging Surface Before Application of Prime Coat

When the metal comes from the drying ovens, after having received its phosphate coating, the skillful use of tack rags plays an important part in removing all lint or dirt which otherwise might be carried into the spray room and covered by the prime paint coat.

Tack rags may be purchased from commercial suppliers or prepared by dipping cheesecloth into a slow-drying varnish, wringing out the excess and allowing the varnish-soaked cheesecloth to partially dry—until it reaches the stage of tackiness. While in this condition, the tack rag will pick up any and all lint or dirt with which it comes in contact. Caution: If the tack rag is used too wet, smears of varnish will be deposited on the phosphate coating. These varnish smears will not unite properly with most baked enamel primers, and a breakdown in the finish may occur where such deposits have been left.

In case any chromic acid stains appear, they can be removed from the metal by sponging it with a 50/50 mixture of methyl alcohol and water. Materials for this work should be kept near the tack-ragging station. This wiping with the sponge should be performed far enough away from the prime paint application to allow the metal to become perfectly dry before the paint is applied.

(Part II will appear next month)

Porcelain Enamel Furnace

The Ferro Enamel Corporation, Cleveland, Ohio, announces the sale of an oil-fired straight-through type continuous furnace with full Alundum muffle to The Toledo Porcelain Enamel Products Co. of Toledo, Ohio. Installation has been completed. The company fabricates and porcelain-enamels metal products for a wide variety of manufacturers and also manufactures its own Toledo line of porcelain enameled building-parts.

Tumbling Barrel Catalog

Tumbling barrels of many sizes and designs are illustrated and described in a new 16-page catalog (pages 8½x11-in.) released by The Henderson Bros. Co., Waterbury, Conn. Tilting oblique machines of many different designs are included with tumbling barrels of the horizontal type. Many of them have built-in motors. They are used for metal cleaning, burnishing, and tumble painting or finishing.

The manufacturer advises us that, "although a wide range of equipment is shown for all types of tumbling operations in the metal, plastics and related lines, we realize that it might be necessary to supply special purpose equipment for jobs that are out of the ordinary. If you have any requirements of this type we will be glad to hear from you, as well as for regularly used equipment which we show."

Thinners for NITROCELLULOSE LACQUERS

BY THE TECHNICAL STAFF
U. S. Industrial Chemicals, Inc.

THINNERS for nitrocellulose lacquers are fundamentally different from thinners for paints, varnishes and enamels. In the first place, the character of the paint, varnish or enamel film is little affected by the thinners used, therefore balance formulation is not as essential as in the case of lacquers. Secondly, the chief hydrocarbon liquids, such as petroleum distillates (naphthas) and coal-tar distillates (benzol, toluol, and xylol) and turpentine, are excellent solvents for the oleoresins comprising the main vehicles in paints, varnishes and enamels, but do not dissolve nitrocellulose. Hence recourse must be had, for the most part, to more expensive solvents of different types.

The difficulties of thinner formulation can best be appreciated by considering the composition of lacquers. A lacquer consists of two primary parts: the non-volatile which forms the film, and the volatile, the evaporation of which causes the drying. The non-volatile part consists mainly of solids —the nitrocellulose itself, the resins or gums, and the plasticizer which may be a solid but is usually a liquid. The purposes of the resin are to give increased adhesion (especially to metal surfaces), to give depth, gloss and brilliancy to the film, and to reduce the cost. The sole function of the plasticizer is to impart flexibility and extensibility, namely, to overcome brittleness.

Now, as previously mentioned, the nitrocellulose does not dissolve in hydrocarbons or alcohols, and will only tolerate them in limited percentages without "kicking out." On the other hand the resins generally are more soluble in hydrocarbons and alcohols than in strong nitrocellulose solvents. It is easy to see that a lacquer, to be suitable for applying (whether by spraying, dipping or brushing) must contain initially and during all stages of drying, proportions of the various types of solvents that will hold both the nitrocellulose and the resin in a homogeneous solution.

Blushing; Orange Peel; Pinholing

If the hydrocarbons evaporate too fast, relatively, to the nitrocellulose solvents, the resin may precipitate, causing a "resin blush" or whitening; and if the nitrocellulose solvents evaporate too fast, relatively, then there may be a precitation of nitrocellulose, namely, a "cotton blush."

A third kind of "blush" may be

caused by the water vapor in the air. Warm air holds more moisture than cold air. As the volatile portion of the lacquer evaporates, the freshly lacquered surface is cooled by this evaporation, and perhaps the air next to it will be cooled below the dew point, in which case moisture from the air will be condensed on the surface. Upon dissolving in the lacquer, the water will precipitate some of the non-volatile constituents, thus causing a "moisture blush." This type of blush is more prevalent in summer because the air then has a higher relative humidity.

Other defects in lacquers may be caused by the too rapid evaporation of the volatile portion. Lacquer, when applied by spraying, leaves the spray gun in the form of small globules which should flatten out to a uniform film on the sprayed surface. If too much drying of these globules takes place during the transit between spray nozzle and surface, a roughened film may result. This poor leveling, known technically as the "orange-peel" effect is less likely to occur with low room temperatures and with the nozzle held closer to the work. Again, should the outer surface of the film dry too much faster than the interior of the film, solvent may be "trapped", which will later escape from the film by forming a small crater. This defect is known as "pin-holing."

Volatile Liquids Necessary

At this point, it might seem that the cure for all thinner ills would be to formulate thinners almost exclusively with the less volatile liquids. However, there are three compelling reasons for not eliminating the more volatile liquids:

1) The less volatile liquids are, almost without exception, the more costly.

2) Their solutions have higher viscosities, which means that larger quantities must be used to give the proper spraying consistency and to deposit a given thickness of film, resulting in a larger loss of volatile materials, and requiring more time for spraying.

3) One of the prime advantages of lacquers, which accounts in large measure for the important position occupied by them in

SOLVENTS AND ALCOHOLS

Material	Wt. Per Gal.	Evaporation Period	Flash Point °F.
Acetone	6.60 lbs.	1.0	—4
Ethyl Acetate	7.51 lbs.	2.4	26
Isopropyl Acetate	7.28 lbs.	——	37
Normal Butyl Acetate	7.35 lbs.	13.4	81
Amyl Acetate	7.16 lbs.	28.8	84
Cellosolve Acetate	8.10 lbs.	60.0	122
Cellosolve	7.76 lbs.	26.0	130
Methyl Alcohol	6.61 lbs.	2.4	52
Ethyl Alcohol	6.79 lbs.	4.7	63
Isopropyl Alcohol	6.55 lbs.	5.4	61
Normal Butyl Alcohol	6.76 lbs.	20.5	95
DILUENTS			
Toluol	7.22 lbs.	7.8	44
Xylol	7.18 lbs.	20.0	78
Hi-flash Naphtha	7.28 lbs.	33.0	100
No. 1 Petroleum Naphtha	6.85 lbs.	5.2	72
No. 2 Petroleum Naphtha	7.15 lbs.	17.4	80
No. 3 Petroleum Naphtha	7.37 lbs.	51.4	120

the finishing field today, is their rapid drying and consequent quick freedom from tackiness, thus permitting early handling and wrapping. The more volatile solvents must be used if this advantage is not to be sacrificed.

Rate of Evaporation

Since the rate of evaporation of the liquids composing a thinner is so important a consideration, a table is presented here to show the approximate evaporation rates. For convenience, the accompanying tabulation is divided simply to separate solvents and diluents, and the alcohols are grouped with the solvents. This is not quite accurate since the alcohols are "latent" solvents, which means that the presence of active solvents is necessary before these alcohols have any effect on the cotton. There are many naphthas available from petroleum, only three of which have been listed, and these three have evaporation rates that are comparable with some of the more widely used coal-tar compounds. As the rate or period of evaporation is dependent upon a number of factors, and buyers, with their finishing foremen, are interested only in comparisons, the tabulation of evaporation periods is based on acetone equal to one. For example: Ethyl acetate requires 2.4 times longer to evaporate than acetone.

Balanced Formulation

Unfortunately, little good data on the viscosity of nitrocellulose in the various liquids and combinations of liquids are available, the much-used concept of dilution-ratio being entirely inadequate.

Finally, it should be emphasized that the volatile portion of a lacquer must be so formulated that it evaporates as a whole slowly enough to prevent pin-holing, orange-peel, and moisture-blush, and fast enough so that the advantage of rapid drying and early freedom from tackiness is not lost. Moreover, the balance between the different types of solvents must be maintained at all times during the drying process to prevent a cotton blush or a resin blush.

A Tailor-Made Thinner

It is evident from the foregoing that a thinner must be "tailor-made" to supplement accurately the specific lacquer. For this reason, most lacquer users prefer to buy the thinner from the manufacturer of the lacquer, in order to be assured of satisfactory results. Otherwise, it becomes necessary to know the composition of the lacquer or to "prove" a thinner by actual trial with a particular lacquer.

In view of the necessity for compatibility between lacquer and thinner, it may be wondered why lacquers are not thinned by the manufacturer before sale to the user. There are two reasons why this is not done. First, in the case of pigmented lacquers, the higher viscosity of unthinned lacquer slows down the settling (prior to use) of the pigment to the bottom of the container, and the formation of a "cake." Second, the lacquer user desires to adjust the viscosity of the lacquer just before applying it, so as to take care of atmospheric conditions of temperature and humidity, and spraying conditions—the particular spray gun used and the air pressure available. If the lacquer were already thinned the user's latitude in making this adjustment would be circumscribed.

Graining with Decalcomanias

BY HAROLD T. DEAN

The correct technique to employ when applying a long narrow strip of decal.

RECENT YEARS have shown a definite increase in the use of lacquer-base reproductions of expensive veneers — due, not only to the decreased cost, but also to the practical methods of application that have been developed. For some time this process was really in an experimental stage and more or less trouble was experienced by firms trying to make practical use of it on a production basis.

Probably the most difficult obstacle to overcome was the presence of air bubbles which persisted in making themselves a nuisance under the transfer. Next was the fact that if the transfers were not handled with such extreme care that the slow work hampered production, there would be visible wrinkles on the surface when the decal backing was finally pulled off.

Both of these defects have been remedied — partly through the formulating of better cements, partly by cutting the thickness of the transfer proper by 50%, and partly by the development of more accuracy and more skill in the application of the transfers.

Our company is using grain reproductions extensively this year and I have had complete success with their application. We use mostly narrow strips for trim —strips of rosewood, zebra wood, oriental wood, stump mahogany and French walnut. They can be bought in sheets 34x50-in., for approximately $1.15 per sheet; also, 50-sheet lots will be cut to dimension for a small additional cost. However, they can be cut successfully by hand, using a safety razor blade and straightedge. These transfers are only workable over a pyroxylin-base coating, which necessarily must be a reasonably heavy coat and sanded smooth.

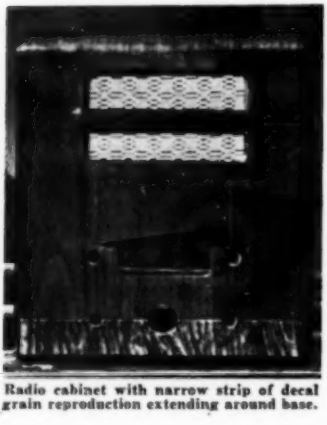
Applied Over Sealer Coat

We apply our transfers over a good coat of sealer. A cement is manufactured by the same company that furnishes the transfers. It is a patented formula of lacquer solvent; this we mix 50/50

with water. Our transfer is then dipped into this solution and wiped off partially so it won't drip on the working surface. It is then held in position, lacquer side down. We affix one end tightly by pressing it down firmly with a rubber squeegee. The squeegee is then pulled forward with a firm pressure while the operator holds the prepared transfer off the surface at a 45° angle and pulls slightly on the free end, as shown in one of the illustrations with this article. This particular technique on this operation is very important, as it is the only method by which you can avoid entrapping air bubbles under the transfer and insuring perfect fusion between the transfer and sealer coat.

Paper Backings

There are two paper backings attached to these transfers. The top one, which is heavy, protects the lacquer film from friction and abrasion when applying firm squeegee pressure. This heavy paper is removed immediately after squeegeeing or rolling. We separate it from the transfer at the corner of one end and then it can be readily peeled off. The other backing, which is under the heavy backing, is a thin tissue paper and is removed immediately by sponging with water. The tissue might remain on until removal was convenient for production.



Radio cabinet with narrow strip of decal grain reproduction extending around base.

After the removal of the final tissue-paper covering, the surface of the grained transfer is exposed to view. However, a thin film or residue of dextrine still remains on the decal surface; this must be sponged off with water immediately. After 30 minutes of drying the decal surface is ready for one or more coats of clear lacquer—the same finish that is sprayed over the remainder of the cabinet.

The heavy backing paper may be left on for a mask if your operation calls for a temporary mask over the transfer for shading purposes, etc.

We have successfully applied this type of transfer to flat panels and then machined them at the rip saw and shaper without any ill effects.

Lacquer reproductions of rare woods and marbles may also be successfully applied to metal, plastics, and glass. Application methods differ somewhat on different products and surfaces. Generally, however, the method of application described here is in use in the radio cabinet and case goods industries.

Universal Shellac Stick Co. Moves

The Universal Shellac Stick Co. of New York City advises the industry that the company is now located in new and larger quarters, at 537-539 W. Broadway. The old address was 28 Howard St.

Making Material Tests

Checking the stability and durability of nitrocellulose shipments at 275°F. Every sample must stand this test for ½ hour. Photograph, courtesy of the Arco Co.

BY W. R. ALLEN

FOR THEIR OWN and their customers' benefit, practically all manufacturers of finishing materials make several different kinds of tests on products they offer to the trade. The tests that are made will depend upon the type of materials, kinds of products on which they are to be used, and the conditions or requirements that must be met.

Notwithstanding the fact that manufacturers of materials go to great expense to make these tests on their products and then strive to maintain uniform standards of quality, some users of finishing materials elect to conduct their own tests of the finishing materials they purchase, or on materials about which they desire more specific information.

The habit of investigation is both natural and cultivated. A constant lookout for trivial matters, as we accustom ourselves to this habit, produces almost microscopic intuition. The smallest deviation or unusual performance of a finishing material arrests our attention immediately, and as a rule discloses new facts or confirms past conclusions.

Often, it has been called to a finisher's attention by a paint manufactur's representative (or vice versa) that a standard material, which he might be using, is easily adaptable to various requirements by changing the method of application, or by thinning the material more or less, as the case requires. This suggestion is sometimes offered as a means of solving a finishing problem that the finisher thought would involve a search for some specific material, or the substitution of a

cheaper product for a more expensive one.

It is a good plan for every finishing foreman to thoroughly familiarize himself with the possibilities of standard materials purchased and used by his company—also, the possibilities of others submitted for approval—then make tests to find out whether or not these materials are adaptable for other products in the company's line.

Any test worth making is worth recording. The results of these tests should not be entrusted entirely to memory. The purpose of these tests is to determine whether or not the material in question will meet the requirements; also, whether or not the advantages claimed by the manufacturer can be verified.

A complete card index system for reporting the tests will make it possible to differentiate between products that meet any or all requirements, and those that don't. This conveniently indexed information enables one to readily determine just how well a prospective source of supply measures up to the standard materials in use, or vice versa.

Many Different Kinds of Tests

Before starting any material tests, some definite knowledge must be had in regard to the purpose of the tests and the procedure to follow. There are many different kinds of tests—for example, tests for viscosity, drying time, covering capacity, adhesion, resistance to contact with various harmful agents, luster and opacity. Each one suggests a different method of procedure. If this fact is not kept clearly in mind during the test, attention may become focused on something trivial or startling, and the main objective of the test may never be obtained.

Of course, too much detail can be included in certain tests and the reports on same. Both simple and extensive tests reveal different characteristics of materials. Each point or phase should be reported clearly. The first paragraph of the report should include an outline of all that is to be reported. Then keep each phase of the work in chronological order and follow an indexed or tabular form similar to that suggested here.

1) Authority: Letter references for making test. (Letters from manufacturer to company or individual, etc.)

2) Object: Purpose of test and why it should be made.

3) General Method: Outline procedure.

4) Apparatus: General description of spray equipment, size of nozzle, air pressure, other equipment used, functions, etc.

5) Details of Method: Show complete details and instructions of what was done to start, proceed with, and complete the test.

6) Theory: A discussion of the manufacturer's formulas or ingredients as far as possible, symbols, units, etc.

7) Log: A complete report of observations and results.

8) Conclusion: Discussion of results, comparison with standard materials, previous tests, errors and recommendations.

Appraisal of Results

As a rule, the conclusion is what interests the average reader, but all details, as outlined, should be carefully tabulated. All contributory data, manufacturer's

literature, calculations, notes, etc., should be filed in envelopes, properly labeled, named and dated, and attached to the card index, making sure that the reports are indexed alphabetically or coded, so that they are easily accessible at all times.

I had the experience of having one large organization referring to their files on a test of material made for me, after it had laid dormant for three years, which clarified a disputed point and saved several thousand dollars worth of business.

We must have cooperation if we are to succeed in any line of endeavor and, generally speaking, paint manufacturers, their customers, technical societies, and trade journals are willingly exchanging ideas today for the general benefit of all concerned.

Portable Safety Fence

OFTEN A workman in the finishing or metal cleaning department has to do work the nature of which requires that he should not be disturbed by anyone passing close by; or it may be that he is doing something that could harm anyone standing too near him; for example the pouring or stirring of acids or paint materials of some kind. Or there may be an area of the floor that has been made extremely slippery by the accidental spilling of a quantity of oil or paint. Or perhaps there is some valuable freshly finished goods placed close to a trucking aisle or passageway.

Small temporary danger areas like this should be promptly guarded in the interest of safety. One suggestion is a portable railing or board fence consisting of three or four sections (each about 30-in. high and 4 or 5-ft. long) hinged together like a folding screen. The sections can be hinged together in a such a way that they will fold up flat or spread out rail-fence style to guard any specified area of space.

It is suggested that the fence sections be painted white and lettered DANGER in red, or vice versa. These portable fences can be quickly set up to protect an area, and then moved aside when not needed.—C. H. W.

Floor Wax Bulletin

The Franklin Research Co., 5134 Lancaster Ave., Philadelphia, Penna., announces a new technical bulletin on "Franklin's Aerated Rubber Gloss Wax", which is a 4-page folder discussing the "coefficient of slip" (slip resistance) of floor wax.

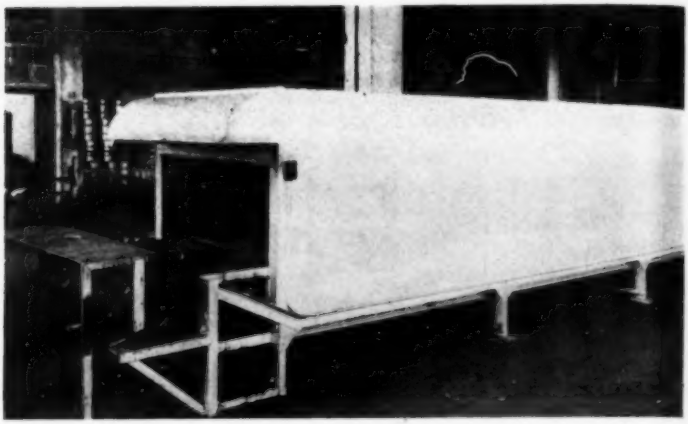
This bulletin illustrates the latest method for testing the slip resistance of various floor waxes. It offers tabulated data showing results of slip test, one, two, and three days after application of the waxes. Other approved devices are illustrated and discussed.

Testimonials by the General Testing Laboratories in Detroit about the slip resisting qualities of Rubber Gloss Wax are quoted and an opinion regarding slip is made by a noted Philadelphia law firm.

A small testing device is offered free to those persons interested in making accurate tests at their desks of the floor waxes they buy.

Cabinet Oven Bulletin

Accurate control of ovens at all temperatures, gas and electric heat, recirculating systems, time dial on door, pilot light signal, tray hangers, indicating thermostat — these are some of the features described and illustrated in a new bulletin of 8 pages 8½x11-in., recently prepared and published by George Koch Sons, Inc., Evansville, Ind. The bulletin contains data on and pictures of several models of GKS cabinet ovens. Copies can be obtained by writing the company direct.



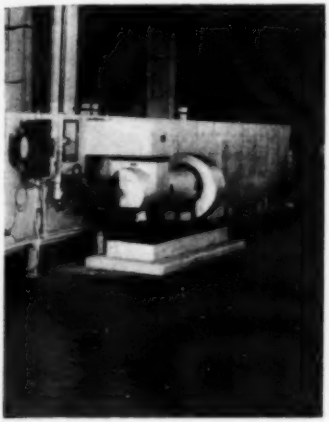
Automatic Japanning

BY E. A. ZAHN
Works Laboratory, General Electric Co.

AUTOMATIC japanning is a popular method of finishing metal parts on a production basis. The word "automatic" seems to imply that the only function left requiring hand labor is the loading and unloading of a black mechanical monster that devours unfinished metal parts and delivers them nicely finished without further consideration.

This mechanical monster has no mind of its own nor does it have a faultless digestive system, therefore it requires continuous attention other than feeding. This is particularly true if it is of the type that includes metal-cleaning equipment. There are many sizes of finishing units, with as many different degrees of finish quality requirements, and each one must receive a certain amount of attention if you expect to obtain efficient operation.

The design and construction of an automatic japanning unit is based on the size, weight, and shape of the parts to be finished. Size of parts governs the spacing of hanging facilities as well as the openings to cleaning compartments, the open area of dip tanks, and the oven openings. Too often the design is based on the size of parts under construction at the time; then it may be discovered too late that additional work or changes in the design of work



Revealing practical information about the design and operation of automatic mechanical equipment for cleaning, dip-coating, flow coating and bake-finishing metal parts—with valuable suggestions and recommendations in reference to vapor degreasing, japan and solvent mixtures, viscosity of material, temperature control, oven operation and ventilation.

A tunnel type oven with direct-gas-fired externally-mounted air heater—used for baking finishes inside new steel barrels. Photograph supplied through courtesy of Despatch Oven Company, Minneapolis.

# of Metal Parts

makes the entire equipment unsatisfactory. This point should be kept in mind when planning a new installation.

The weight of metal parts to travel through the equipment must be considered also. The conveying mechanism must be designed to carry the maximum load, with proper consideration for future load increase possibilities. Facilities for heating cleaning solutions must have sufficient capacity to offset the amount of cold steel that travels through the system.

Weight of Parts in Process

Total metal weight is of minor importance only in those applications where heat is not applied to the japan mixtures. Where hot mixtures are used, the heavier metal parts generally carry enough heat over from the cleaning operation to avoid cooling the japan. With light metal parts that are heat dipped, the japan mixture usually is heated by steam coils placed around the tanks or by heating units positioned in the circulating system.

While heavy metal parts are beneficial to the hot-dipping method, they can be a nuisance to the cold-dipping systems if they carry too much heat to the japan tanks. Some cooling equipment is necessary between the cleaning and dipping stations, or the entire apparatus must be constructed with enough travel distance to allow proper cooling.

The total load weight of paint-

ed metal presents its most serious problem in the oven. Suppose, for example, that 50-ft. of chain space carrying a total metal weight of 250-lbs., dipped in a japan that cures at 390°F., would produce a satisfactory hard surface in the present oven length. If the same chain were to carry twice that weight some additional heat would have to be supplied to produce the same hardness in the same length of time.

Some authorities are of the opinion that the heat carried out of the oven is retained longer by the heavier metal and will compensate for the oven entrance loss. It has been proved that this extracted heat has very little value, as the temperature of the parts soon falls below the curing point of the japan when the parts leave the oven.

Shape of Parts Influences Design of Equipment

The shape of the parts deserves serious consideration during the selection of equipment design. Sometimes it is necessary to incorporate a certain amount of flow-coating apparatus with the dipping arrangement in order to force paint into recesses that might not be reached by the gravity flow of material in a dip tank.

Recessed areas in parts to be japanned can best be cleaned by the vapor-degreasing method, although some of the combination liquid and spray alkali washers are quite efficient for this type of work.

The best method of draining such parts calls for careful consideration. The hanging arrangement should facilitate drainage of solvent in the vapor-cleaning machines, as well as drainage of cleaning and rinse water mixtures in the alkali washers. It should also provide for complete coating in the japan and, above all, complete drainage of all excess japan after dipping.

Metal Cleaning Problems; Vapor Degreasing, etc.

The manual labor required for operating a japanning unit is not confined to loading and unloading. Where alkali cleaning is involved, the cleaning solution concentration must be kept constant by periodic checking. Some of the more efficient units are provided with an overflow that carries away oil and dirt washed from the metal. The overflow water is then filtered and pumped back into the cleaning tanks. Any stoppage due to clogged filters would become a serious menace in a short time, therefore this end of the machine requires almost constant attention for efficient cleaning. Special equipment is required to take readings and to maintain an accurate solution strength.

If oil and other foreign matter are carried over into the rinse tanks and become attached to the surface of metal parts in process, you defeat the purpose of metal cleaning. The effect will be quite noticeable in the finish—generally producing water rings made up of hundreds of little microscopic blisters.

Those japanning units that include solvent vapor-degreasing equipment, although they differ greatly from the alkali system, also require attention. The acid number of the solvents must be checked regularly, as it increases with the amount of metal being cleaned. The cleaning efficiency of these systems is entirely de-

pendent on the heat control of the solution. Heavy metal parts travel a greater distance through the cleaning compartment than light metal parts before active cleaning is effected. The part itself must reach a proper temperature before the vapors will condense and flow down over the surface.

Material Control; Maintenance of Correct Mixture

An important step in japanning—one that requires constant supervision—is the control of the japan and solvent mixture. Japans cannot be purchased economically in a mixed condition ready for use, therefore the material must be thinned on the job. Since the japan tanks normally hold large quantities of japan and solvent mixture, it is necessary to add solvent or unmixed japan to raise or lower the viscosity as required. This important function is an item that allows no guess work, nor can an operator judge from the appearance of the finished parts whether or not more or less solvent is required, because sometimes there are thousands of parts between the ones being unloaded and those leaving the dip tank.

It is impossible to determine, from the appearance of the wet coat, just what the finished surface will look like. Mixture control, by measuring the volume of solvent or heavy japan added in the tank, is of no use because the evaporation rate of the solvent varies with the different temperatures and the amount of work passing through the system. The use of hydrometers is not an efficient method of controlling the japan mixture because the hydrometer is not sensitive enough to temperature changes. Furthermore, high temperatures require a different mixture from low temperatures in order to obtain uniform results.

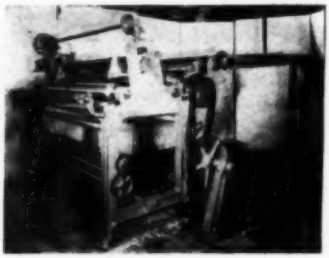
Different Temperatures Mean Different Viscosities in Material

At the present time, measurement of the material's viscosity is the only reliable method of finding out whether the japan is too thin, too thick or just right. Even then, the information obtained by viscosity readings must be used in conjunction with a prepared viscosity temperature change chart.

To prepare such a chart, the ideal mixture must be determined.

(Continued on page 66)

A tunnel type oven equipped with direct gas-heating system, used for baking finishes on pans and containers. Photograph, courtesy of Despatch Oven Company



Some of the problems involved in coating paper surfaces with new varnishes, lacquers and waxes to produce an attractive permanent gloss; the use of hot high-solid lacquers; and some of the roller coating machines available for this class of product finishing.

Roller Coating Paper

WITH VARNISHES, LACQUERS AND WAXES

BY FRANK W. EGAN
Chairman
TAPPI Coating Committee

IN SOME industries that use paper stock in large quantities, there is a demand for a paper that has a glossy lustrous finish. A paper is wanted that has a high finish to bring out the brilliancy of the printed ink and add tone to the paper; also, a coating is desired to protect the surface of the paper from moisture.

This demand first led to the coating of paper with spirit varnish which produced a fine high gloss and semi-waterproofness. However, it was found that the varnish had a tendency to darken the paper, due to the resins used, and it was a rather brittle coating. Manufacturers of spirit varnish eventually improved their refining and compounding methods and added plasticizers; they can supply varnishes that produce clear flexible coatings.

Later, lacquer coatings appeared for paper surfaces, but they were costly. In time, lacquer manufacturers developed lower cost lacquers suitable for coating paper, and now these materials are being used extensively.

One of the secrets of producing a high gloss coating on paper is to apply the varnish or lacquer as high a solid content as possible, for the more solvent used the less gloss. Solvent has a tendency to carry the coating more deeply into the paper stock.

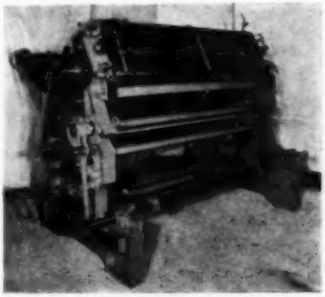
It is necessary for the surface of the paper to carry adequate sizing, so that the applied finish coating will remain on the surface. The sizing also serves the important function of holding the paper fibers in place so they will not rise and protrude through the finish coating.

There are various mechanical production methods of applying

varnish and lacquer to the surface of paper, as for example by the spray, roll, and knife. Each method has certain merits according to the conditions under which it is used.

The roll method works satisfactorily in many cases, especially where the reverse roll is used. The regular roll method leaves ribs, unless an excess of solvent is used, but the reverse roll unit meters the coating, eliminates the ribs, and then casts the coating on the paper surface. The reverse roll coater will apply any coating that can be applied with a brush coater.

The knife coating method proves the best for many operations, for it allows the handling



A special type of knife coater—one that produces high grade lacquer and varnish finishes from viscous coatings.

of lacquers and varnishes having a solid content of 70% to 80%, thereby saving solvent and at the same time applying a coating that can be controlled readily.

Lacquer Applied at High Temperature

Lacquer manufacturers, knowing that the use of solvent adds to the cost of lacquer, proves a fire hazard, and detracts from the gloss desired, have given considerable study to the production of *a lacquer that is 100% solid at room temperature and can be melted and applied at 300°F.—and they have been successful.* Such hot-melt resins or lacquers are procurable today. They produce a coated surface of glass-like finish that is flexible, moisture-proof and has certain oil-proofness.

Either the reverse roll or the knife can be used for the application of metallic or pigmented lacquers, but to introduce pigments into a lacquer and apply them in one coating reduces the gloss. However, it does give a very fine finish.

So far, the methods referred to are related to coatings applied to paper in web form. There are a number of sheet coaters in use that use the regular roll method of application and require an excess of solvent to eliminate ribbing. However the reverse roll method has been incorporated in a sheet coater and it produces the same fine finish as the web machine and it requires less solvent.

New Type Roller Coating Machine

There is a new type of coating machine that is in process of development at the present time, but it may take a year or two to complete the machine before it is practical. It is called the Bracewell Coater. Briefly, it is a roll coater that centrifugally casts the coating on the surface. It is entirely unlike the air spray gun which depends on air to atomize the coating, thereby drying some of the coating which does not adhere to the surface that is to be

coated. This new coating machine applies the coating by using centrifugal force. Material not deposited on the surface to be coated returns into the coating pan.

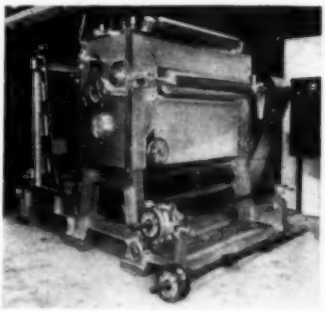
The coating is applied in a fine mist uniformly across the web of paper, thereby eliminating any possibility of overlapping.

The centrifugal or casting roll deposits a uniform coating all over the surface without touching the face of the surface to be coated. This is highly important in the coating of a paper surface, for if the paper fibers are disturbed in the coating operation they rise and protrude through the coating and defeat the purpose of coating, if it is a moisture-proof one. Also, when fibers are disturbed they attract liquid coatings to cling to them in the same manner that a drop of liquid will hold its shape due to the surface tension of the liquid, and if dried in this state a mottled coating will result.

Opaque and Transparent Paper

It is a well known fact that paper is opaque due to the air that is present in the voids of the paper stock. If a paper is to be transparent, then it is necessary to leave the pulp in the beaters for a greater length of time, so that when the sheet is formed there will be fewer voids. This kind of paper is called "glassine." To add to the transparency of glassine, the web is coated with lacquer, with the result that the lacquer is carried into the stock, filling the voids. In other words, a conventional coating operation is partly a saturating or neat filling operation.

The centrifugal or casting roll does not fill the voids in the paper stock. It performs a coating operation only, and in so doing saves a considerable amount of coating material, which is a decided advantage.



Resins having a solid content of 100% at room temperature are applied with this machine at 300°F., producing a coating with an attractive glass-like finish.

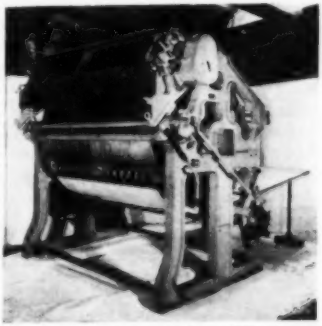
The centrifugal or casting roll coater can be used for coating textiles, artificial leather, nitrocellulose and acetate films, oilcloth, wood and paper composition panels, sheet metal, etc. It is particularly adapted to coating sheet metal that is to be formed into cans and for coating cardboard box wraps.

Decorative, Protective Coatings

Finish coatings for sheet stock may be classified into two kinds: One is classed as decorative; the other is protective. The decorative coating must be glossy, nonscratching, flexible, water clear, and non-ink bleeding. On the other hand, the protective coating must be moisture resistant, nonscratching, oil-proof, self-sealing —and, for food wraps, nontoxic.

With these requirements you would naturally think that manufacturers of finishing materials for paper surfaces had a hard

problem to solve. Well they did, and so did the machine manufacturers who had to design and build machines to apply these coatings. However, the market proved so attractive that progressive manufacturers developed synthetic resins, lacquers and ma-



This unit produces 4000 to 5000 sheets per hour with a lacquer or varnish coating of high solid content. A lustrous finish is obtained because of the small amount of solvent used in the lacquer.

chinery suitable for coating paper surfaces efficiently and economically.

Nitrocellulose Film

There has been considerable paper-surface finishing done by combining nitrocellulose and acetate films, also glassines, to paper printed surfaces. This has been accomplished by coating the films or glassine web with a non-water-soluble coating, and applying it free of ribs (for they show through the transparent webs) partly drying the coating so that it is in a tacky state, and then making the marriage.

This method produces a highly satisfactory finish that has good wearing qualities, splendid gloss, and it is transparent. In some cases the transparent films and paper stocks are printed on the back side and then combined. This places the adhesive behind the ink and gives a clearly printed job.

The greeting card field seems to prefer casein and mica coatings, for these materials present finishes that are attractive and suitable for color printing.

Lacquer Metallic and Wax Coatings

Lacquer metallic coatings are being used more than ever. Pigmented lacquer coatings make ideal combinations with metallic lacquer coatings in the greeting card and decorative fields. All of these coatings can be applied with a knife coater that has special attachments for this work.

Wax coatings have improved to such an extent that they play an important part in the utility end of food wraps. They are preservative, self-sealing and can be procured in rather a clear state. They are best applied where the water dip cooling method is used. The disadvantage of wax is that it is easily scratched and soiled. This fact has led to the development of the hot-melt resins mentioned heretofore. At the present time there is quite a price differential between wax and hot-melt coatings, but time will probably shorten the gap in price, for manufacturers are introducing methods that will reduce the costs of the hot-melt resins.

The introduction of certain new resins, such as the hot-melt group, have made it necessary to produce equipment that would apply them. You cannot utilize a wax coating machine, although heated, to apply hot-melt resins because the rolls do not hold their concen-

tric accuracy. To apply a hot-melt resin, it is necessary to maintain a roll accuracy of .0001-in. for a coating of .0001-in. means approximately a coating of 1-lb. per ream of 25x38-in.—500 sheets or 3300-sq.ft. Usually a coating of 3 to 6-lbs. is applied.

To accomplish this the rolls have to be ground under special conditions. And when they are positioned in the machine the bearings and frames are prepared so that the rolls maintain their accuracy under operating conditions. A special insulated housing is required; also a unique doctor rig that produces the glass-like finish which is characteristic of hot-melt resins.

The Problem of Ink Printing

Ink manufacturers have had to change their methods of compounding inks so that the inks would not bleed. This meant the elimination of binding agents that could be softened or made soluble by the solvents used in the coatings. This occurred when the coatings were applied on top of the printing. It was also discovered that the newer coatings would not take ink readily, for they were non-porous and their glossy finish did not give the ink much to "hang on to." These conditions had a great effect on their art. However, they have been able to change their formulas and produce inks that are giving excellent printing qualities on the newer paper coating finishes.

It is rather difficult to cover all the phases of the newer paper coated finishes in detail in a short article. However, the revolutionary changes that have been made, or that are in the process of being made, have been mentioned and the new coatings and machines referred to are making tremendous effects in the paper industry. Eventually these changes will be felt in the textile, sheet metal, and other industries where coating plays an important part.

One-Coat Finishes Preferred

From the economic angle it is best if the finishing material can be applied in one coat. Some coatings require a priming coat before they are applied, because their components consist of certain ingredients that give good gloss, flexibility, and moisture-proofness or oil-proofness, but are absorbed by the body stock. This absorption is prevented by a prime coat. However, it is essential that the solvent in the second coat must not soften the first coat, or mottling will occur.

If the readers of this article will write and tell us what their experience has been in using varnish and lacquer; also, what they feel are the best features in the coating finishes of their products, it will be of interest not only to the Author and Editor, but also to many readers of this magazine, for the letters will be published for the benefit of all.

Book About Removal of Rust and Scale Deposits

The removal of scale and rust deposits from water-cooled equipment is a problem that frequently confronts many industrial plants. There is a growing demand for more information on the subject. In this connection, Oakite Products, Inc., 22 Thames St., New York, N. Y., has just prepared a new illustrated booklet describing how a recently developed material, Oakite Compound No. 32, is successfully meeting a wide range of scale and rust-removal problems. The booklet consists of 20 pages 3½x8½-in.

Varnish Film Troubles

BY F. R. BOYNTON

Forman Finisher lists a number of varnish film troubles, tells what usually causes them and suggests practical ways to prevent them.

INASMUCH as varnishes are still used to a considerable extent in production woodfinishing, and since certain troubles occur in connection with this work (due chiefly to incorrect use of the material or unfavorable conditions in the finishing room) I feel prompted to explain some of the most common causes of varnish film failures.

Crawling Varnish

This condition can be recognized by the fact that the varnish acts like oil on a wet surface. It fails to adhere closely to the surface over which it is applied. In some places it crawls, wrinkles or puckers up in tiny waves or folds.

The cause of varnish crawling is usually due to the fact that the varnish has been applied to a surface that has not been properly cleaned, or to a surface that is so smooth and hard and glossy that varnish will not stick to it. A cleaned surface that has received the touch of soiled or perspiring fingers or hands is almost sure to be a source of trouble. Perspiration really produces a faint film or trace of mild acid and grease.

If a surface has been cleaned or washed for refinishing and if some of the cleaning solution still remains, you have another possible cause for varnish crawling. Still another occasional cause for this trouble is the practice among some finishers of adding drier to the varnish. The varnish manufacturer puts in the right amount of drier and it is unwise for the finisher to add more drier, especially since he is probably unfamiliar with the chemical actions involved. Also, when he mixes two or more kinds of varnish together, the finisher is inviting trouble. Improper application will leave thin and heavy streaks, with the resulting runs, sags and curtains.

When varnish is applied too heavily the outside surface takes on oxygen and soon becomes too large and heavy for the mass of soft varnish under it. As a result it draws up in wrinkles or ridges.

"Silking" or "Enameling" of Varnish

When drying varnish takes on the appearance of leather or is grainy, this is called "silking" by some, and by others "enameling."

The cause is a cold finishing room . . . . applying cold varnish over cold units to be finished, or spraying warm varnish on cold units, or vice versa. The temperature in the finishing room should never be less than 70°F. at any time—and the surface to be coated and the varnish being used should be close to the same temperature. When a second coat of varnish is applied over a coat that is not thoroughly dry, the "silking" effect is likely to show up.

Seedy Varnish

This defect looks as if someone had thrown sand over the surface before it had become tack free. Allowing the varnish container to be unprotected or unsheltered during freezing or below-freezing temperatures is one cause for this trouble. The use of a varnish that is not sufficiently aged will also cause it. Allowing the varnish to become chilled while transporting it in zero or sub-zero weather will cause chilling of the oil and a chemical reaction of the driers in the varnish.

The remedy is to bring the varnish to the proper room temperature of 70° or 80°F. before using it. A "green" varnish or one that has been recently made will look all right for about an hour or so after having been applied, but it will dry with a seedy or sandy surface. The seedy particles are bits of gum resins, congealed oil or driers. Driers that have crystallized are usually the main trouble.

Age does not impair a varnish if it is kept properly in tightly closed containers. Age will allow it to ripen and will materially improve its performance. Of course, if it is allowed to remain uncovered it will loose some of its volatile thinners and will become thick and viscuous, and it should be thinned and strained before being used.

Pinholing, Pocking, Blotching

The causes of these defects are similar. In pinholing the filler is the most common cause but in some cases the veneered stock is to blame. Pinholes, in the past, have been very expensive, but in later years this trouble has become negligible, although sometimes it still shows up and is annoying and expensive. If proper care is used in cleaning (sanding) the wood, and if it is filled correctly, the finisher will have very little if any trouble with pinholes.

Pocking presents a different problem. Pocks are much larger than pinholes and are sometimes caused by mixing two or more varnishes together, or by a change in the atmosphere from a dry to a damp condition. This is a common trouble in finishing rooms that are not properly air-conditioned. A sudden drop in temperature during the summer can cause the pinholing or pocking of a varnish film. The excessive moisture in the hot air is condensed and particles of water are formed on the surface, which prevents the coating from taking hold as it should.

Then there is another defect called "blotching." This can be caused by thinning the varnish with turpentine or benzine. Varnish is very particular as to what it associates with. If it is thinned with an incompatible thinner you are likely to have some real trouble on your hands. Filler that is improperly wiped off will also cause blotching; it leaves an unsightly blotch on the surface after the varnish has been applied.

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Samples on request

Sweaty Varnish

Gloss varnish or flat varnish that has been rubbed too green will invariably sweat. The friction of the rubbing compound and pad will heat the varnish film and a dull greasy surface will appear a short time after the rubbing operation. A long-oil type of varnish will sweat more easily than one of the short-oil type. Long-oil varnishes are not formulated to stand much rubbing. Varnish that is not aged enough will sweat, but this is only found in the cheapest grades of varnish.

Loss of Gloss

This objectionable feature can be traced to units being placed in a draft while drying, or to improper or careless filling of the wood. The application of varnish over undercoats that are not thoroughly dry will also cause loss of gloss. Sometimes the trouble is traceable to the use of improperly seasoned or unseasoned lumber, or to the use of highly absorbent composition panels.

Cracking and Checking

This is a common type of failure. The cause depends on the type of coating used, the climatic conditions, the temperature and numerous other elements and conditions. What I mean by cracking and checking is the presence of fine or coarse lines extending, in some cases, all over the varnished surface. The degree of courseness of these checks or cracks usually depends upon the length of time the film has been deteriorating.

Severe changes in the weather when the varnish film is not thoroughly dry, and the use of cheap and non-elastic undercoaters will cause cracking and checking. Also, if a very slow-drying varnish is put over a quick-drying varnish, it is likely to check. The use of varnishes that have different degrees of drying promotes checking.

Excessive amounts of ammonia fumes, coal gas and strong alkalies—all of these have a destructive effect on varnish films. Unevenness of application (differences in the film thickness) is probably the cause of most varnish film failures, where two or more coats are applied. The mechanical strains set up cause reaction and an early break-down. It invariably comes to one point: The sealers must have more elasticity than the following coats and these must be used progressively. An experienced finisher knows how to do this. This will prove itself, for if the principles are reversed there is a very short life for the surface coating. If the finisher will study his varnishes and learn just what to expect of them, and perhaps what they are made of (the manufacturer will be glad to advise on any technical points) he will get much better results.

Cloudy or Blooming Varnish

This is usually a mottled or irregular effect of opalescent hue produced by dampness, improper driers, and cloudiness in flat varnishes due to the presence of too much of a certain kind of flatting agent. Drafts and lack of adequate ventilation invite blooming. This is common in furniture factories where short-oil varnishes are used and where there is often excessive humidity. When a varnish film takes on a blue hue, this is usually caused by the presence of excessive moisture on the film; generally it goes away when this

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condition is changed. The storage of freshly varnished goods in dark places sometimes produces a discoloring effect on the varnished film—usually turning it to a yellow or green tone.

The surface coatings in use today are far superior to those used a few years ago and the finisher with a basic knowledge of these materials can do much toward maintaining their performance at par. Spraying equipment plays an important role; also the use of pressure equipment aids in producing a film of uniform thickness—and it steps up production. When things are running smoothly, that is the time to be on the alert; failure to do so invites trouble that can become serious, since it has a chance to gain a foothold before one is aware of it.

Cleaning Metal Before Painting

GOOD ADHESION of paint, enamel or lacquer to metal surfaces is dependent on the cleanliness of the metal with respect to grease, oil, rust and foreign deposits.

Various methods of cleaning have been and are being used to clean metal surfaces preparatory to finishing; for example, washing with naphtha, burning off with heat, wiping with prepared acid solutions, washing with alkali solutions, and vapor-cleaning commonly called degreasing.

None of these methods, in itself, constitutes a complete cleaning process. All must be supplemented with additional operations if a really first class cleaning job is desired.

Naphtha cleaning is a relatively expensive and hazardous method, generally used only for small parts and small quantities. Contamination of the naphtha with oil occurs quickly, leaving an oil film on the metal which is undesirable. This method does not remove rust nor does it readily clean seams, folds or recesses, which may retain oil that later shows up on the finished product.

Burning-off requires an oven capable of quickly raising the temperature of the product to be finished to about 500°F. At this temperature grease or oil is burned off, leaving a residue which must be wiped off. This is a sure method of killing the grease or oil but it does not take care of rust or dirt and it may be injurious to some products.

Acid solutions, offered under various trade names, are used commonly for rust removal. They etch the metals slightly, thus producing good paint adhesion surfaces. However their application, with moistened rags while the workmen are using rubber gloves, is more or less messy. Cleaning of recesses, folds and seams is not entirely satisfactory by this method. Fairly recent developments have been made in the application of certain of these solutions which enables the use of immersion methods and which overcomes some of the objections to their use.

Alkali cleaning, by means of immersion tanks or washing machines, is probably the most common form of cleaning used for heavy production. This method is relatively inexpensive but has some objectionable features where high grade finishing is desired. Alkali washing does not get down into the pores of the metal and

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And you'll like the character of DULUX, too. It has a clear, bright film with excellent depth of appearance. It has the resistance to cold cracking, scratching, printing, marring, water and alcohol you can expect from high quality lacquer.

In fact, DULUX is a finish that combines the flow and build of varnish and the speed and quality of lacquer.

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does not readily clean recesses, folds or seams. A combined dry and burn-off should follow the final rinse to assure the elimination of any remaining oil or moisture.

Vapor cleaning or degreasing has become increasingly popular. It offers a convenient and a not too costly method of cleaning where oil or grease removal is the primary object. Cleaning of recesses, seams and folds are readily accomplished, if of such a nature as to permit drainage while the product is being withdrawn from the cleaning tank. Rust and surface dirt are not removed with this method.

Certain types of products may not lend themselves to vapor cleaning on a large production basis. Their construction may be of such a nature as to form pockets into which the vapor may condense and be carried out, thereby increasing the vapor solvent cost beyond a reasonable amount.

With any method of cleaning, the product should not be touched with bare hands after cleaning, if good paint adhesion is desired.

The cleaner the metal surface, the more susceptible it is to certain types of finger perspiration, which eventually show up as rust spots beneath the paint.—H. R. MADSON.

Rubbing Methods Changed

IN REFERENCE to rubbing the finishes on furniture, one of our friends submits the following interesting observations, based on contacts in many furniture factories:

"One particular thing we have noticed is that more and more furniture factories are getting away from rubbing with pumice. They are using fine grade abrasives in its stead, lubricated, of course, with special solutions. We find also that to obtain a good satin finish, this can be accomplished very easily with a light portable sanding machine that has a pad which moves forward and back repeatedly, as in hand sanding. In some finishing rooms it is customary to use a fine grade of steelwool on the sanding pad." —ED.

Pump valves and other valves subject to unusual abrasive or corrosive action are now being successfully made of Kennametal, the new intermetallic compound of tungsten-titanium carbide, manufactured by McKenna Metals Co., 139 Lloyd Ave., Latrobe, Pa. Recent tests indicate that valves made of Kennametal will far outlast valves made of other materials.

Fire Extinguisher

"What You Should Know About Fire Extinguishers" is the title of an interesting and informative bulletin that tells you about fire classifications (A, B, C and D) and what equipment to use for effectively combatting each type of fire. It gives you a short course in first-aid fire protection for every type of fire and fire hazard. Copies of the bulletin can be obtained from Pyrene Mfg. Co., Newark, N. J.

New Lights for Making Fluorescent Paints Glow

The Continental Lithograph Corp., 72nd St. at St. Clair Ave., Cleveland, Ohio, has just released illustrated bulletins which show several new models of ultra-violet (black light) spotlights for use in feeding power by means of invisible rediations to the various Conti-Glo fluorescent light-emitting paint products.

Quoting from one of the bulletins: "The unit pictured utilizes the new 100-watt Mazda mercury lamp of the CH-4 projector spotlight type. It throws an intense beam of harmless, invisible 'near' ultra-violet energy up to 40 or 50-ft. Beam spread 30°."

Finishing Pecan Wood in THE BLOND COLOR

BY R. E. CASEY

FOR SEVERAL years some of the southern desk and chair manufacturers have been using pecan wood* in the manufacture of office and school furniture. They have had excellent success with this wood and have found a ready market for their products. When properly prepared and finished, the surface of pecan wood is beautiful. The lumber varies in color, which makes it difficult for the finisher to "uniform" it; however, this is being done every day in desk and chair factories.

The blond finish is now popular for school and office furniture, therefore I believe it will be of interest to tell how we bleach and finish this pecan wood. The first step is to see that all exposed parts of the wood to be finished are clean and smoothly sanded. Next we prepare a light crack filler to match the blond color in which the wood is to be finished. We press this crack filler firmly into the flaws that require repairing. After allowing plenty of time for the crack filler to dry and harden, we sand the wood to a smooth surface.

Preparation of Bleach Solution

With this preliminary preparation of the wood completed, we prepare and apply a mixed bleaching solution. A number of bleaching materials are on the market, and probably there are different ways to use each one, depending upon the particular kind of wood to be bleached. However, here is the way we use the bleaching compound our company buys:

We mix three parts of No. 2 bleaching solution with one part

*The hardwood pecan is a member of the hickory family, its botanical name being Hicoria. Of the several species, the one of commercial importance as a cabinet wood is sweet pecan—not the cultivated pecan nut tree.

The timber grows chiefly in the southern states where it is found with red gum, oaks and other southern hardwoods. Trees in the best stands are of suitable size and character for sawing into commercial lumber, and some of the logs are cut into veneers. The lumber can be kiln dried on about the same schedule as walnut.

Pecan wood has an attractive grain quite similar to walnut and can be finished to match and closely resemble both walnut and mahogany, or it can be bleached and used as a blond wood. The heart wood is pale to deep reddish brown, occasionally characterized by reddish streaks. Sap wood is light brown to nearly white. It is utilized in the manufacture of furniture, fixtures, hardwood trim and hardwood floors. Its hardness and strength make it especially useful for the slender members of chairs, and it is well adapted for making bent wood parts when the bends are not too abrupt. It costs considerably less than walnut and is available in large quantities.—ED.

Another Finishing Room

View showing 4" I-Beam Overhead Conveyor handling case goods through sap staining area prior to stain booth.

Planned
Engineered
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View showing overhead I-Beam Conveyor through finishing room. Operators on right are sanding the wash coat. Operators on left are rubbing and padding filler after leaving filler spray booth shown in the background.

by **PALMER-BEE** at the plant of Johnson-Carper Furniture Co., Inc., Roanoke, Va.

The above installation is typical of the many furniture plants equipped with Palmer-Bee conveyors. At no cost to you one of our skilled engineers will analyze your plant and production, submit a plan and program through your finishing room — warehouse — cabinet room — machine room. Avail yourself of this service.

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of No. 1 bleaching material, being careful to mix the material in a clean earthen jar or crock, and we stir it with a clean wooden paddle. Now we are ready to apply the bleaching material. At this point, a word of caution: Be sure that the operator wears rubber gloves, as this material is injurious to the skin. If some of the material does come in contact with the operator's skin, it should be promptly washed off, using apple vinegar to cleanse the skin.

The bleaching solution can be applied with a sponge or spray gun. See that a thoroughly wet coat is applied; then rag it out to a nice smooth even coat, using a cotton rag for this purpose. It requires about four hours for the wood surfaces treated with this bleaching material to dry. In some cases certain parts of the wood may require a second application of bleach, particularly on darker portions. Dark streaks in the wood can be bleached by adding a strong bleaching powder to the No. 2 bleaching solution. Next, use No. 6/0 abrasive paper to sand the wood down to a smooth surface.

Acid Stain; Wash Coat of Lacquer Sealer; Filler

Apply a light blond acid stain. Acid stain will help to prevent the bleached surface from turning yellow with age, as some light finishes have a tendency to do after being exposed to light for a considerable length of time. When given the proper time to dry, acid stain is non-fading.

When the stained surface is perfectly dry, spray on a wash coat of high quality lacquer sealer. We prepare our wash coat by diluting one part of lacquer sealer with three parts of thinner. When the surface is dry we hand sand it and apply a light blond filler. When the filler is flattened down it is ready to rub off. We use a soft towel for this work and we are careful to rub across the grain of the wood. If necessary, we rewipe the surface. We use a pick brush to remove excess filler from places that can not be readily reached with the wiping rag.

When the filler is dry we apply a full wet coat of water-white lacquer sealer. This sealer is almost colorless and will not darken the wood. The sealer coated surface is hand sanded with No. 6/0 abrasive paper and dusted off thoroughly with compressed air.

Finish With Lacquer; Burn-in Repairs

To build up a body to the finish, we spray on two coats of water-white lacquer. Then the furniture is moved to the rubbing department where it is rubbed down to a perfectly smooth surface. It is then advanced to the burn-in men who inspect the finish for flaws and defects and make any repairs that may be necessary. These burn-in men mean a lot to a furniture finishing department, as one of these skilled workmen can fill in a scratched or marred surface with stick shellac and a hot knife—doing the work so expertly that the repaired place cannot be detected afterward.

Convection Heating Units

A new 24-page catalog from The Trane Co., LaCrosse, Wisc., shows beautiful color illustrations of Trane convectors—heating units for homes and offices. Descriptions and explanations of this modern system of heating are included.

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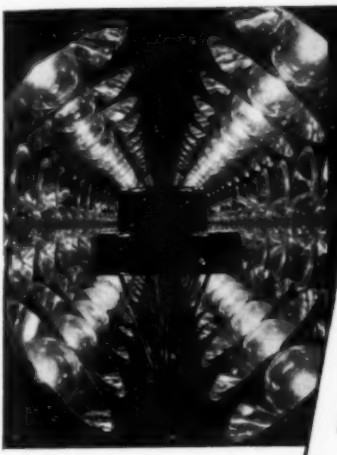

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Infra-Red Finishes

A newly developed line of finishes designed especially for use with infra-red baking equipment is announced by Ault & Wiborg Corp., 75 Varick St., New York, N. Y. The company's low-bake finish, Polymerin-100, which is included in this line, has been used extensively for some time with infra-red systems, where it is reported to cure rapidly, providing a hard, flexible and durable film.

Ault & Wiborg engineers have made comprehensive studies on infra-red finishing problems. Formulations they have developed include both undercoats—primers and primer surfacers — and topcoats in a full range of plain colors with no limitation as to lustre. A hammered effect and wrinkle finishes are also available. These finishes enable manufacturers to benefit by the time-saving and space-saving merits of infra-red applications, and yet maintain satisfactory characteristics of hardness, flexibility, durability and adhesion.

Radiant infra-red heat installation at the Steel Storage File Co., Cleveland, Ohio. Polymerin baking schedule here is under five minutes, with infra-red equipment.

Speed schedules made possible with Polymerin have, in some cases, been reduced even further by utilizing infra-red baking equipment. A storage file, for example, which will ordinarily bake for 15 minutes at 300°F. with Polymerin, is being baked in an infra-red lamp setup in five minutes. The speed-up made possible by specially designed A & W finishes used in a large auto plant resulted in a 30% saving in light costs. Polymerin infra-red finishes are being used successfully in a variety of industries, it is reported.

The use of infra-red for industrial baking started several years ago, but until recently, infra-red has not been widely utilized because of a general lack of knowledge of its use. Today its application in finishing is spreading rapidly, thanks to a growing understanding of the efficient utilization of infra-red baking principles.

New...

MATERIALS SUPPLIES EQUIPMENT

Protects Hands

"Hovey Hand Shield" is a white creamy preparation which, when rubbed into clean hands, protects them from paint, lacquer, varnish, grease and dirt of all kinds. It is soluble only in water; wonderful for any man who gets his hands dirty or smeared with paint; keeps the hands soft and respectable looking. The material is a product of Hovey Spray Equipment Co., 1511 Spring Garden St., Philadelphia, Pa.

Beauty EXPOSED TO VIEW

Many commercial products have certain elements that may be utilized in adding beauty when properly finished and exposed to view.

Perhaps one or more of your products have such elements that have not been exploited to the full extent of their real worth because of ineffective finish and inadequate exposure. Isn't it worth while to check up on the possibilities of making such merchandise more attractive to the eye . . . and in turn more salable?

Let our creative studio analyze your finishing problems and suggest ways of exposing the finer qualities of your products to better advantage.

There is no cost or obligation to reputable firms for this service. Write for complete details.

FREE . . . A larger print of above illustration, suitable for framing, sent free upon request.

ROCKFORD VARNISH COMPANY

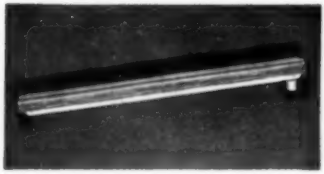
Manufacturers of Finishing Materials

ROCKFORD • ILLINOIS

NO TAMPERING WITH QUALITY

Plastic Diffuser for Fluorescent Lamps

A new plastic device that snaps onto the fluorescent lamp effectively reduces glare from bare lamps to provide better quality illumination for offices, factories and hundreds of other applications. This new device is called "P-F-C" (plastic fluorescent channel) and is applicable for both



Tinted Plastic snap-on . . . reduces glare.

1 and 1½-in. lamps. Richly grained, "P-F-C's" are available in five colors, namely, white, light blue, yellow, pink, and pale green. They are decorative as well as functional; economical to install; shatter-proof and therefore present no hazard. Maintenance costs are at a minimum as there are no panels to take down. The "P-F-C" simply snaps right off the lamp; product of The Edwin F. Guth Co., 2615 Washington Blvd., St. Louis, Mo.

Resists Fire, Alcohol and Weak Acids

"Bakeflex," a new transparent finish for floors, bar tops, counter tops and table tops, is claimed to protect surfaces from burning cigarette butts, stains, alcohol, mild acids, and oil or grease.

According to the manufacturer, Flexrock Co., 2300 Manning St., Philadelphia, Penna.:

The bakelite base of 'Bakeflex' is responsible. This invention is a tremendous step from the old time wood floor preservatives.

To apply Bakeflex you simply take a cloth or brush and apply it as it comes. Keep spreading it in a thin coat in one direction. It will seek its own level, penetrate the pores of the floor material, table top, counter top, or woodwork, and preserve the surface.

The second coat will present a varnish appearance. Simply apply an additional coat every once in a while, depending upon the service to which the floor is subjected.

To get the best results, the surface should be perfectly clean before Bakeflex is applied. However, this is not necessary where the preservation is more important than an immaculate appearance.

Wetordry Masking Tape

The Minnesota Mining & Mfg. Co. of Saint Paul, Minn., announces a new type of all-weather tape known as Scotch Wetordry Masking Tape. New features of this tape are as follows:

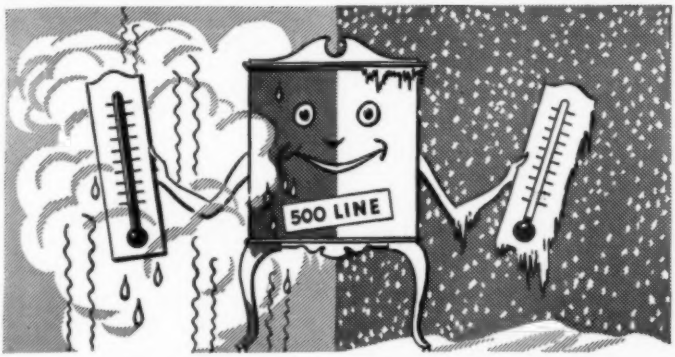
No Sweating: A uniform adhesive tackiness is maintained regardless

The package and a roll of tape.

of weather. Humid and damp weather conditions will not affect it.

Dead Stretch: A new feature which eliminates curl-back and gives smooth application to curves.

More Flexible: Makes easier application to curves.



A Furniture Finish

the thermometer can't faze!

A large furniture manufacturer had "hot and cold" headaches, caused by checking, cracking, disintegration and other ills that beset ordinary finishes under extreme temperature changes. He challenged us to demonstrate our "500" Line against the lacquers and sealers he was using.

So we took panels finished with the two products, and subjected them to alternate heat and cold ranging from 5 degrees below zero to 110 degrees, Fahrenheit. The ordinary finish didn't last through the first change of temperature. The "500" Line was still unaffected after *ten complete cycles,* when the manufacturer declared himself convinced and placed his order.

594 LACQUER SEALER **595 GLOSS LACQUER** **596 FLAT LACQUER**

Whether you ship to the Equator or the North Pole—whether the calendar says July or January—Glidden's "500" Line takes them both with equal equanimity. Moreover, it's free spraying, smooth flowing and resistant to marring, printing, alcohol, water or hot oil.

Why not let the Glidden man demonstrate the "500" Line to you?

THE GLIDDEN COMPANY • **National Headquarters, Cleveland, Ohio**

Branches or Factories in Principal Cities

TIMPLATED
GLIDDEN PRODUCTS CARRY THIS FAMOUS MARK OF QUALITY

GLIDDEN
Everywhere on Everything

Thinner Construction: Makes the tape especially desirable for 2-tone masking, as it reduces the pile-up at the lap of colors.

Strong Backing: In spite of thinness, strength of backing is maintained.

Adhesive: The correct amount of adhesive for efficient use on chrome trim, upholstery, paper aprons or for regular repaint work.

Because of the thin, strong backing, this new tape has proved to be a real help in painting the increasingly popular 2-tone automotive paint jobs. Thinness is the feature that reduces to a minimum pile-up at the lap of colors. Flexibility is handy in striking sharp curves beneath the windshield and other parts of the body.

Those who have already tried Scotch Wetordry Masking Tape feel that it is an advance step in masking tape construction.

A C P Rust-Proofer

A C P Rust-Proofer is a liquid chemical that rustproofs the surfaces of iron and steel when used according to directions. Before the metal surface can be treated, paints, oils and other organic coatings must be removed. Also, mill scale and coatings of loose, spongy rust must be removed. Thin coats of light rust, however, will be chemically destroyed, and need only be brushed with a wire brush before applying this rust-proofer.

After the metal has been prepared, A C P Rust-Proofer is applied by brushing, or with a spray-gun, in as heavy a coating as will hold to a vertical surface. (Brushes or sprayguns used in its application should be thoroughly washed with water after use.) The chemical is allowed to air-dry on the steel for from four to twelve hours; then the light-colored coating which has formed on the metal must be thoroughly rinsed with clean water. The rinsing can be done with a hose. The rinsed coating is allowed to air-dry thoroughly. When it is completely dry, it is ready to receive the first coat of paint.

The steps in this process should be so planned that the application of the chemical, the rinsing, the drying and the painting will follow without delay. It is important to paint the rinsed coating as soon as it is entirely dry. One gallon of this rustproofer should treat from 200 to 500-sq.ft. of cleaned metal, depending upon the condition of the surface and the method of application. This matrial is a product of the American Chemical Paint Co., Ambler, Penna.

Marine Finishes

Development of four new marine products, a marine spar varnish and three new "Dulux" marine colors is announced by the Finishes Division, Du Pont Co., Wilmington, Del.

The Marine Spar Varnish is intended for use on new wood or on previously varnished wood where it is not possible or necessary to remove the old finish completely. It is described as an excellent medium to secure a satisfactory build with few coats. It also eliminates the necessity of a wood primer. In many cases, one coat is sufficient to complete the job.

The spar varnish dries dust free in approximately 30 minutes, tack free in four to five hours, and is ready for another coat in six to eight hours. It dries with a hard, tough, flexible, water-resistant film, with excellent exterior durability and good adhesion to wood and metal. It is pointed out, however, that the durability and gloss retention of this spar varnish is not as great as that provided by "Dulux" Marine Clear in a finish built up in successive coats over a primed surface.

The three new colors of ship and deck finish are designated as Biloxi Blue, Hatteras Gray, and Belfast Green. These three additional shades increase the line of ship and deck finishes to ten different colors.

Biloxi Blue is a clean bright blue similar to the color of the water

DEFY *Extremes*
OF TEMPERATURE AND HUMIDITY WITH
Day's Lacquers and Sealers

After a finished object leaves your plant, are you sure that the appearance will remain in good condition for a reasonable length of time? Remember that Summer heat, Winter cold and extremes of humidity must be taken into consideration.

In selecting finishing materials, you can obtain Lacquers and Sealers which have been pre-tested to determine their durability. Day laboratory tests, together with performance records on actual production, permit scientific recommendations.

These recommendations are your guide to greater finish durability. You can rely on the well-deserved reputation of Day's Lacquers and Sealers for longer life, greater economy and better appearance.

An explanation of your requirements will bring suggestions for Lacquer and Sealer that give the utmost in value.

JAMES B. DAY & CO. CHICAGO

Kindly mention INDUSTRIAL FINISHING when writing advertisers

around Biloxi. Hatteras Gray is not as dark as a battleship gray and has a clean blue tone. Belfast Green is a rather bright, light green not as dark as an emerald green, and a popular tint for cabin roofs or forecastle decks.

Ship and Deck Finishes dry quickly, permitting the boat to be put back into service in a comparatively short time. Experience indicates that these finishes are resistant to oil and gasoline, are superior in durability, and retain their color and good appearance over an extended period.

Ventilating-Exhaust Fan

The Autovent Fan & Blower Co., Chicago, Ill., announces a newly perfected 'Allvent,' all purpose ventilating fan that provides any normal required amount of air changes without objectionable noises.

Features include V-belt drive that makes possible slower, quieter operation and greater efficiency with 1750-r.p.m. stock motors than heretofore obtained with costlier, low speed special motors.

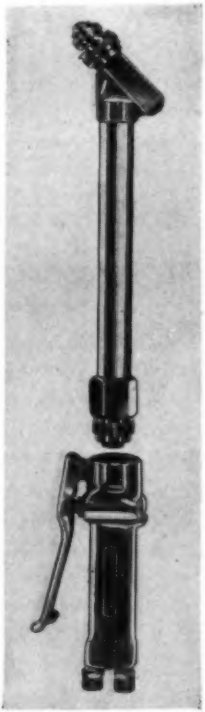
A new design 3-blade fan wheel supplies or exhausts unusually large volumes of air at extremely low speeds. Large enough volumes of air are handled to do a comfort-cooling job as well.

Extension Spray Gun

The Eclipse Air Brush Co., 300 Park Ave., Newark, N. J., has just put on the market an improved extension spray gun known as the Type EX. This gun is for painting large surfaces beyond the natural reach of the operator, without the use of scaffolding and staging. The operator stands on the floor, and as the extension gun is supplied in lengths up to 12-ft., he can paint the average wall and ceiling without having to climb.

The extension gun is also useful for painting large surfaces such as railroad cars and ship hulls. Surfaces below the level of the operator can also be safely handled with extension gun equipment.

The Type EX extension has a detachable gun-grip control, and different lengths of shaft can be used



6-ft. extension gun complete weighs only 4½-lbs.

in the same grip. The shaft turns in the grip so that spray can be in any direction. The spray head is supplied in either of the two standard Eclipse models to insure the proper application of all types of materials.

Many uses for an extension spray gun will occur to production and maintenance men in many factories.

Here's a hard, porcelain-like finish that can certainly take high temperatures — up to 600°F. It bakes quickly, requires no size, develops amazing adhesion and stands up wonderfully under fumes, fabrication and wear. Minute-Cote is a new, different, better product for roller, dip or spray application . . . Available in a wide range of colors, it resists light and holds its color in light or dark. Try it yourself. Write for an experimental sample of Minute-Cote today — now.

MINUTE-COTE

BAKES IN A FEW MINUTES

TOUGH JOB HEADQUARTERS

℞ Prescription Finishes

Give us your metal coating problem. We guarantee you an answer based on your conditions, and not just a standardized formula.

THE WATSON-STANDARD CO.

Manufacturers of

PAINTS . . . VARNISHES . . . INDUSTRIAL FINISHES AND LITHOGRAPH COATINGS

FACTORY AND GENERAL OFFICES: PITTSBURGH, PA.
WAREHOUSES: BOSTON · BUFFALO · DETROIT · NEW YORK

To Finish Masonite

We have a request from one of our customers for information on Masonite finishing. They want to know what kinds of sealer, filler and finishing material are used. We thought perhaps you would have this data on file. If so, we shall appreciate receiving it so that we, in turn, may pass the information on to our customer. —S. P. Co.

We are sending you tear sheets of a 2-part article on this subject by Mr. G. L. Hardy, as published in Sept. and Nov. 1938 issues of INDUSTRIAL FINISHING.

In the supplementary comments (see part 2) offered by Mr. R. T. Miller, chief engineer of the Masonite Corp., you will notice that the Masonite Corp., 111 W. Washington, Chicago, Ill., has a list of recommended materials for use in finishing their product. We suggest that you write them for this information — or have your customer write them.—ED.

Bar Finish

We, together with 12 other banks in various sections of the country, operate a gratis research advisory service for our industrial customers and one of them presented the following problem:

"We manufacture store and bar fixtures of principally walnut but sometimes of mahogany or birch. Our product must carry a hard lustrous finish. It so happens that the cornice of the bar is frequently used for scratching matches which quickly results in an eyesore.

"Is there any finish which we can use, or is there any plastic or metal which could be economically placed over the cornice of the bar, which might eliminate our trouble?"

We shall appreciate your comments . . . . —LIBERTY BANK OF BUFFALO.

We question whether there is any wood finish that will stand up under this severe abuse (match scratching) very long without showing the effects mentioned by your customer. By letter we are submitting a list of finish manufacturers who claim to have burn-proof and mar-proof finishes.

We are not sure how molded plastic surfaces would react to repeated match scratching, but our guess is that permanent marks would soon result. However, this could be quickly determined by experiment.

Our suggestion would be to place metal where the match scratching occurs — bronze or stainless steel—this metal to be bare, that is to have no coating of clear lacquer or varnish. Probably an attractive as well as practical utility design could be worked out which would be entirely satisfactory—perhaps an all-rough surface or a surface with alternate areas or bands of

Questions; Answers

Questions are welcome and will be answered promptly by mail. Readers are invited to prepare and send in additional information relating to any of these questions and answers.

EGYPTIAN

FLEXIBLE CLEAR LACQUERS

AIR-DRY CLEAR LACQUERS for use on sheet metal which is later to be formed into the finished article... Excellent adhesion to brass, aluminum, lead, copper, oxidized copper and steel. Flexibility which will withstand severe bending... Full gloss and brilliance which dress up a product to that final eye appeal. Egyptian Flexible Clear Lacquers are tough and extremely durable and may be buffed after forming if desired.

Flexible Lacquer Enamels of the same qualities and characteristics are also available.

Further details upon request

THE EGYPTIAN LACQUER MANUFACTURING CO.
ROCKEFELLER CENTER
NEW YORK

EGYPTIAN FINISHES
HIGH-BAKE N-F-R
PERSPIRATION RESISTANT LACQUER
FINISHING LACQUER
ZINC CHROMATE PRIMER
COLORED ENAMELS
WRINKLING LACQUERS
NOVELTY FINISHES
Details on Request

EGYPTIAN FINISHES

EGYPTIAN *Superior* FINISHES

smooth and rough sections. While the striking of matches might mark this surface slightly, it could be readily wiped clean from time to time.

We are somewhat surprised to learn that people are still using the old fashioned unsafe matches that strike on any surface. In this part of the country practically everyone uses safety matches. —ED.

Flock Coating in Airplanes

An aircraft company in this city is contemplating the use of flock in the construction of planes, both for the purpose of interior finishes for decorative effects, and also in certain ducts and parts of the ship for sound-deadening effects.

If you have a treatise or any data or information on flock, we would appreciate receiving this by return airmail; also, particularly, any data you have in connection with the use of flock for sound-deadening purposes. particularly on the inside of air ducts or pressure ducts and other metal parts. Any engineering data you have on this subject of sound deadening, as applying to flock, will be appreciated. In fact almost any general data or information you have will be desirable.

Also, can flock be obtained or furnished that has been treated so as to make it fireproof or flameproof? If not, after the flock has been applied to the surface, could a chemical be sprayed on without injury to the flock? This angle is quite important.

Also, do you have any information or data from the industry concerning any chemical reaction that might take place when flock is applied to metal, or to be specific, to aluminum or dural sheets. Will the natural corrosion from aluminum affect the binder or the flock, causing it to loosen, discolor, etc.?—M. J. Co. (Distributor of equipment for the application of flock).

We have published several articles, by various authors, on the subject of flock finishing and we are sending you tear sheets of these. Many of the questions you ask are answered in these articles.

A coating of flock over metal does have a sound-deadening effect, but exact engineering data on the subject would have to be determined by a series of experiments or tests on the metals to be used. Probably a coating of long-fiber flock would dampen sound more than short-fiber flock.

Flameproofing, fire-resistant chemicals are available for spraying onto a flocked surface—the same materials that are used for flameproofing various fabrics. We do not know whether flameproofed flock material can be obtained from the flock manufacturer. For information on this angle and other points you ask about, we refer you to leading manufacturers of flock material (see advertisements in this magazine).—ED.

Cost of Custom Finishing

In June issue of INDUSTRIAL FINISHING the question was raised about the cost of custom finishing jobs. There doesn't seem to be any fixed cost that you can apply to custom work, as you are

called on to do so many different kinds of finishing on so many different articles. One job may be high class and the next one as cheap as possible.

If you are making a run of any certain article and have an experienced finisher, you should be able to fix your own cost by running a sample. By keeping the time required and the cost of finishing materials used, plus whatever you wish to add for overhead, profit, etc., you should be able to arrive at a figure that will represent a fair price. A custom shop is called on to finish practically everything, both new and old.

After long experience you learn to figure costs with reasonable accuracy. If you have special decorated pieces to finish, you must figure time and material and add anywhere from 25% to 50% for these jobs. If you have a run from some shop that calls for a specified job, finish a sample and figure your own cost according to what you wish to make to give yourself a good profit. Custom finishing can be profitable and pleasant work, but you must have workmen who can do all kinds of finishing.—J. K. COOPER.

Recovering Solvents

In your issues of February and March, 1940, we notice a 2-part article entitled, "It Is Smart and Profitable to Recover Used Solvents," by Mr. D. G. Miller of the Barnstead Still & Sterilizer Corp.

This article made it seem very simple for anyone to recover lac-

Here's another **NEW DEVELOPMENT**

in finishing materials, backed by more than 80 years experience

THRESHER Pigmented Wiping Stain—SERIES 400

This new development in stain offers increased adhesion, exceptional clarity, easier working properties, better color uniformity, excellent non-settling properties and, above all, LESS COST per unit.

Further Information and Samples Will Be Furnished on Request.

THRESHER'S High Standard Varnishes MADE GOOD SINCE 1859

THRESHER VARNISH COMPANY
DAYTON, OHIO

Paint — Varnish — Enamel — Lacquer

Kindly mention INDUSTRIAL FINISHING when writing advertisers

quer thinners, but this has certainly been contrary to our experience.

We have tried out several stills of large prominent still manufacturers but, so far, we have been unable to secure satisfactory results.

We have tried to use a continuous process vacuum still heated by the aid of steam. It seems that the steam coil, which is in the still chamber, soon becomes coated with a mixture of solids which are in the dirty thinner entering the still chamber. The coating is composed of nitrocellulose, pigment, resins, plasticizer and dirt. We are able to secure only about 15 to 30 gallons of clean thinner from the still when the operation of the still is slowed down to a production where it is impossible to operate profitably. It would seem that this coating, which forms around the coil, acts as an insulating material.

If you or anyone can offer us any assistance in this matter we would thank you very much.—B. A. Co.

To begin with, the recovery of solvents by users has been tried again and again for years. Most of those whom I know, who have tried it, have discarded it. Of the hundreds of concerns I have contacted in our territory (Newark, N. J.), we know of only two who have been partially successful in the recovery of solvents from dirty lacquer thinners for their own use.

Dry cleaners and laundries can recover a solvent such as naphtha, and there are a number of concerns making special apparatus for recovering trichloethelen and carbon tetrachloride from degreasing operations. However, it is a far cry from recovering a single clean solvent from solvents contaminated by dirt and grease and the recovering of solvents from a dirty lacquer thinner composed of from two to a dozen solvents and containing from 5% to 40% of nitrocellulose, pigment, resins, plasticizers and dirt.

The recovery of solvents from dirty lacquer thinner, far from being a simple operation, actually requires quite an elaborate procedure such as the Lofgren Process, involving not one but a number of distillations in different types of stills and with intermediate treatment. Just how much treatment and how many distillations are required will vary, depending on the composition of the thinner and the residue.

The proper recovery of sol-

Imperial FINISHES
for Industrial Use
Black Baking Japans, Baking Enamels, Synthetic Enamels, Varnishes, Tire Paint, Aluminum Paint, etc.
THE AKRON PAINT & VARNISH CO., AKRON, OHIO
Dependable Products Since 1878

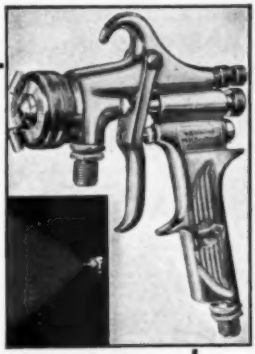
★ MILBURN FAMOUS
"HOLLOW AIR" ATOMIZATION

SUPERIOR FOR FINER FINISHES

The "Hollow Air" atomizes spraying materials with a minuteness heretofore not attained. Results in higher efficiency, speed, wider and wetter spray.

Construction has unique features — light, forged body of strongest aluminum alloy — stainless steel parts — removable threaded head and . . . . . exclusive "Hollow Air" Atomization.

Write for literature



The ALEXANDER MILBURN Company

Patents:
No. 2,082,060; 2,082,061
2,126,088; 2,126,089

1402 W. BALTIMORE ST.
BALTIMORE, MARYLAND

vents is not a matter of theory alone; it also involves practical experience. We have seen some ludicrous, as well as dangerous, samples of what may result from the efforts to solve such problems by a number of otherwise capable high-class chemists, but men who lacked practical experience in this work.

For instance, probably you have such men in your employ, and the manufacturer of the still you describe undoubtedly gave due consideration as to how you were going to use the still before designing it and selling it to you. Yet, from our experience, we not only marvel that you obtain any results but that you have not had a serious accident — which brings up another important consideration.

The recovery of solvents from lacquer thinners is a hazardous business. Serious accidents occur even in plants carefully operated and supervised by experienced men with the most modern and adequate equipment. This fact is recognized by the insurance companies and, in many cases, any possible saving by a manufacturer recovering his own solvents is much more than offset by the increase in his insurance costs.

I will not discuss some of the fantastically low estimates of the cost of recovering solvents, except to point out that while they might apply to the simple recovery of naphtha by a laundry, they have no relation to the cost of properly recovering the solvents from a dirty lacquer thinner. Furthermore a low recovery cost can well mean the loss of so much of the valuable solvents which might be

A Good Sealer and Undercoater Should Make a Product

LOOK BETTER • LAST LONGER • SELL QUICKER

Shellac Does All Three—and Does Them Best!

SHELLAC INFORMATION BUREAU

Write for specific details to — 70 Pine Street, New York City

FOR DEFINITE PERMANENT RESULTS

Blanchit

WOOD BLEACH

L. R. van ALLEN COMPANY

(Patent Licensee) CHICAGO

recovered by a more adequate and expensive method that, in reality, the cheaper method would prove to be by far the most expensive.

In conclusion, we would suggest that you send your dirty thinner to a plant specializing in the recovery of solvents, if there is one in your locality. If no such service is available and you accumulate sufficient quantities of dirty thinner to warrant the expenditure of from $5,000 to $10,000, then employ an experienced solvent recovery engineer to build you an adequate and reasonably safe plant and teach you how to run it.

CAUTION: Recovered solvents should be used in process work only when proper control is possible by the user, either through chemical analysis or, better still, by actual test of each batch in the user's plant.—RAYMOND S. ANDERSON.

Porcelain Enameling

We wish to obtain information on porcelain enamel baking and porcelain enamel coating materials for coating products before baking. If you know of any manufacturers who produce this material for coating before porcelain enameling, we would be pleased to have you advise these concerns for us, or give us their names.

We have a large gas-fired oven here which was previously used to obtain temperatures from 1000° to 1600°F., and we believe this should be suitable for baking the glazed material on our products, hence the request for information concerning these companies.

We would also like to know if you know the average length of time required to bake a porcelain enamel finish, and also the necessary time required to heat it up and cool it down.—Y. Mfg. Co.

We are manufacturers and suppliers of a complete line of materials for porcelain enamel and can also furnish you with the necessary equipment.

The normal practice for a porcelain enamel ground coat is to fire the ware at a temperature of from 1580° to 1600°F., for about five minutes. For cover-coat enamels, the firing temperature is about 1520°F. for about three minutes.

Raw material requirements are porcelain enamel frit, clay and miscellaneous chemicals such as borax, magnesium carbonate, etc. The ware should be formed of steel known as "enameling stock." It is prepared for enameling by passing through the following tanks: Cleaner tank, rinse tank, acid tank, rinse tank, neutralizer tank.

Ground coat enamels are ordinarily applied by dipping, and cover-coat enamels by spraying, which would require a dip tank for enamel, and spraying equipment. The steps in the enameling process include steel preparation, enamel grinding, enamel application, enamel drying, and finally the firing operation.

The preceding paragraphs are simply intended to give you an idea of the fundamentals involved in porcelain enameling. If you will furnish information as to the approximate volume of ware for which you are considering a porcelain enamel finish, and a sketch of the available floor space for your enameling department, we will be pleased to submit a layout sketch for your consideration and quote you on all necessary materials and equipment. We can also have our representative call to go over the procedure with you in detail. We shall welcome an opportunity to be of service.—THE O. HOMMEL CO. (Enamelers Guild Division)

5,000,000 BTU'S PER HOUR

Ready for shipment, these five Despatch **Controlled Combustion** Air Heaters will deliver 5,000,000 BTU's of heat into a single Despatch oven. Shipments like this testify to the popularity of these new Despatch air heaters.

Write for interesting bulletin No. 72 today which tells all about the new **Controlled Combustion feature,** why it was needed, how it was developed and what it does . . . . . .

DESPATCH OVEN CO.
MINNEAPOLIS, MINN.

Kindly mention INDUSTRIAL FINISHING when writing advertisers

Finishing Conveyor, 18-ft. a Minute

An article in the June issue of INDUSTRIAL FINISHING, entitled "Conveyorized Finishing is Definitely Advantageous" (pages 34-39) states that trays are placed on 6-ft. centers and the conveyor is operated at a speed which will produce 1440 cases in an 8-hour day.

At this rate it turns out three cases per minute, which requires a speed of 18-ft. per minute. In a 20-ft. booth, with two sprayers, it gives an allowance of about one minute per case, per man. Is this information correct? It does seem to be wrong.—B. FURN. CO., A.B., Supt.

This conveyor does actually travel 18-ft. per minute, with trays spaced on 6-ft. centers, which provides for 180 major pieces per hour, or 1440 major pieces per 8-hour day. At this speed, it allows for 40 seconds spraying time per case, per man. This is not considered an unusually fast moving conveyor, as we have one large plant in Virginia operating at 22-ft. per minute.

It must be remembered that the Memphis Furniture Mfg. Co. is running large cuttings through the finishing room—and a type and quality of furniture much different from the type that you are manufacturing. In your plant (which I happen to be familiar with) you find it necessary to have a larger assortment of pieces and much smaller cuttings than they do at Memphis, which naturally retards your spraying operation.

Referring to the Lenoir Furniture Co. installation, as featured in an article published in Sept. 1939 issue of this magazine, their spray booths are much shorter (as I recall 8-ft. or 10-ft. in length) with only one operator in each booth. They are producing 520 cases per day, with the conveyor traveling about 7-ft. per minute. The spray operators at Lenoir have more than ample time to take care of their work.

A cedar-chest manufacturer in Virginia produces as high as 1200 cases of highly finished merchandise, with only one spray booth operator in each booth.—E. S. DAVIDSON, Sales Manager, Palmer-Bee Co.

Clean filtered air is important in all modern finishing departments.

Advance Paint Co. Establishes High Point Branch

The Advance Paint Co., Indianapolis, Ind., has completed arrangements for placing a complete line of finishing materials in stock at High Point, N. C., for the furniture trade. Finishing materials will be supplied for the states of Virginia, North Carolina and South Carolina. Mr. S. S. Hurt, who resides in High Point, has been appointed as representative in this territory and he will also have charge of this branch. Mr. Hurt is well known to the furniture industry in this territory.

Airless Blast Cleaning for Metal Parts

A new bulletin (Circular No. 4) sent out by The American Foundry Equipment Co., Mishawaka, Ind., describes and illustrates several different production machines for dry cleaning metal parts with forcible sprays of small abrasive particles. No compressed air is used. Some machines operate on the tumbling principle. In others a special wheel rotates at high speed and throws the abrasive violently against surfaces being cleaned. Machines of the continuous type are included in those described and illustrated.

Sherlock had the right "dope"

Subjecting the pertinent facts to keen and expert analysis brought Sherlock Holmes amazing success. The same basic technique, applied by Stanley engineers, can solve YOUR finishing problem. . . give YOUR sales a "shot in the arm". Why not discover for yourself what our scientific coating detectives can do to cut your application time, reduce your finishing costs, increase your product's sales appeal? Your inquiry will be welcomed and incurs no obligation. Address Dept. G.

THE STANLEY CHEMICAL CO.

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Lacquers · Enamels · Synthetics · Japans

A SUBSIDIARY OF THE STANLEY WORKS NEW BRITAIN CONN.

Automatic Japanning of Metal Parts

(Continued from page 27)

A sample is then taken to the laboratory where facilities for rapid temperature changes are available. The sample is weighed on a chemical balance; then it is cooled to a point equivalent to the lowest possible working temperature. The sample is again weighed and solvent is added to replace the amount evaporated from the original total weight. A viscosity reading is taken at each degree of temperature rise and recorded on graph paper. The sample should remain on the scales during this time in order that the small amounts of solvent may be added to replace what evaporates during the process. The final reading is taken at a temperature equivalent to the highest reasonable working temperature.

There are many different types of viscosimeters avaliable for this work and each one requires a different technique in handling. One is of simple unit construction and can be left submerged in the liquid being measured while not in use, therefore it does not require cleaning after each reading.

An operator of a japanning outfit must familiarize himself with the unit so that he will know exactly how long it takes for an addition of solvent or paint to become thoroughly mixed, after which viscosity readings may be taken. Faulty mixtures, aside from producing unsightly finished work, can cause the finishing cost to be excessive by requiring the stripping and refinishing of parts, or by coating them with unnecessarily heavy films. In fact, the efficiency of the entire japanning unit is based on accurate viscosity control.

Some installations are designed to include paint storage tanks and pump systems so that the dip tanks can be emptied while the machine is not in operation. This type of system allows easy cleaning of the dip tank and also prevents excessive solvent evaporation. In some systems there are areas in which a quantity of unmixed japan or solvent can "hide" for several hours without becoming thoroughly mixed with material being used. In such cases, it is advisable to recirculate the mixture two or three times before starting the machine.

A time interval should be provided between the dip tank and

Finishing processes today take front rank with other production operations in the factory. In many instances, there is evidence of even larger expenditures for modern equipment for the finishing department than for various other departments. In late issues of Industrial Finishing magazine, there have appeared several articles descriptive of conveyor finishing systems used in both metal-working and woodworking plants, the installation costs of which ran into thousands of dollars. Manufacturers have become aware of the fact that conveyor systems whereby materials in process of fabrication, from the raw state to the finished product, moving speedily and definitely from one operation to the next, contribute to lower production costs, better workmanship and more highly improved and finished articles. This magazine will continue to publish articles featuring successful stream-lined systems of production finishing. Watch future issues.—EDITOR.

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CRANK CASE
Find out Sealer about this!

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Write for Prices and Samples

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the heat seal of the ovens, so that the japan coating may "set" before striking the intense oven heat. This will prevent reflowing due to the sudden application of heat. In some cases 20 to 25 minutes should elapse before the coated parts reach the oven heat seal. Sometimes these pre-set areas have temperature control for further insurance against any reflow of the material. It is always good practice to remove from the coating as much of the free solvent or volatile part as possible before heat is applied, in order to reduce oven contamination.

A perfectly finished part can be ruined in a poorly operated oven. Oven temperature indicators are quite necessary, but they do not always indicate the temperature in all parts of the oven. By making a number of tests with a traveling indicator, which records the temperature on a smoked paper chart, it is possible to arrive at the proper setting for oven controls. The heat seals on either end of the oven should be so constructed as to baffle the heat and prevent it from escaping through openings. Heat circulators help to promote a uniform temperature throughout the oven, and are quite essential in large ovens.

Oven Ventilation Essential

Ventilation in a japanning oven is also an important item. At the top side, and particularly in direct line with the space where the work first receives the high temperature, is an ideal position for the largest ventilator. Other smaller ventilators also should be

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provided, the size and number thereof being determined by the amount of painted surface passing through the ovens. If the oxygen is used up too rapidly it can cause no end of trouble to the finish, particularly in appearance. If proper ventilation is used, the oxygen input will be adequate and, as a result, better curing at lower temperatures can be obtained.

Although an oven can be equipped with enough ventilating stacks when it is first placed in service, it will still require attention from a maintenance standpoint. A certain amount of non-volatile matter is carried away from the japan during the baking process and some of this clings to the oven walls and other inner surfaces, particularly near the ventilating stacks. A well constructed oven should have clean-out traps at the base of each vent stack, so these surfaces can be readily cleaned.

The greater part of japan work is done on metal parts before assembly. The finished parts often pass through unreasonably rough handling and become damaged to the extent that retouching becomes necessary. It is difficult to make ordinary painting materials adhere satisfactorily to a baked japan surface. In this, lacquers are probably the worst offenders, particularly where the finished pieces must withstand moisture.

It is a general fact that the efficiency of any coating or finishing system is in direct proportion with its qualities of adhesion to the surface. This is also true of final coat applications, and since most paints do not have sufficient bond to a baked japan surface, it is necessary to use a material that

will not become brittle upon drying. Some inexpensive asphalt-base materials have been found to be quite satisfactory for recoating small areas on baked japan surfaces.

Wax Finishing Raw Wood

THE FINISHING of bare wood with hard wax only, is not new. Wax forms a finish which is not only beautiful, but which is highly moisture resistant, not readily marred, and easily restored or repaired. Several different waxes may be suitable for this purpose but I prefer straight carnauba wax—a natural product available in quantity at reasonable prices.

Let us assume that we want to wax finish a part or product made of beech, birch or maple. The final sanding of the piece in the white must be thorough, preferably with sandpaper as fine as No. 8/0, and preceded by about 12 hours by a warm-water sponging. Use no glue or other sizing in the sponging operation, as the wood pores must be left open to permit penetration of the wax.

When wood surfaces are thoroughly sanded and "insured" against future grain raising by at least one sponging and resanding, place the products in a warm room for several hours—if possible, overnight. The wood must be made thoroughly warm clear through, so that it will be distinctly warm to the touch. A room temperature of 110°F. would be about right.

Carnauba wax comes in lump form and should be ground or crushed for use to accelerate its solubility. Add 1-lb. of the pulverized wax to one gallon and one pint of VM&P naphtha. Car-

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2. Will cover a surface up to 31" x 80".
3. Automatic roll cleaner.
4. Cuts production costs.

GRAINING PLATE DIVISION
American Electrotype Company
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nauba wax is quite insoluble, but will go into solution in the naphtha at a temperature of about 165°F. This is just the temperature of the water bath of an ordinary glue pot which is properly adjusted to maintain a correct temperature in the inside container for animal glue.

The wax, while having a much higher melting point by itself, will go into solution completely in the naphtha at a point below its boiling point. Due to its insoluble character, the wax will drop out of solution again as the material cools—somewhere around 110° to 100°F. When cold, it takes the form of a thin paste. Then we have about a 10% solution which will keep indefinitely if kept tightly covered to combat evaporation of the solvent. It must be used warm, and it makes no difference whether it is reheated or freshly made.

Hold the prepared wax at a temperature between 150° and 160°F. while using it. Apply the warm solution to the warm wood with as large a brush as practicable (if brushing is to be the method of application) taking a small area at a time only and spreading a thin wet coat as rapidly and as evenly as possible. The temperatures of the wood and solution are important, as they govern the penetration.

After the wood products have been coated in a warm room, move them out to cool. The waxed surfaces will be ready for polishing in about 15 minutes. There should be no great excess of wax on the surface. If there is, the wood or the solution is too cool; or the solution has been applied too heavily; or it is too concentrated for the texture of the wood. The cooled, coated surface should just

show a slight whitish glaze—just sufficient to show a slight smear when rubbed with the finger.

Use a mechanical polisher if possible. The polishing may be done by hand (depending upon the size and shape of the pieces) but this involves real labor.

A loose muslin buff wheel on a flexible shaft rig is recommended for the purpose. A cloth belt or a stationary arbor wheel may be used on such articles as can be picked up and manipulated on the machine. Work across the grain to induce a filling action. Use plenty of pressure, as the surplus wax on the surface must be removed, leaving only that which is actually "in" the wood. It will be apparent here why stress is laid on the penetration, as the ease and economy of the operation is dependent on the balance between that property and the labor of removing the surplus, which is merely waste to accumulate on the polishing wheel.

Avoid touching the polished surface, if possible, for a few minutes after polishing, as the heat of the wheel will soften the wax sufficiently to make it finger mark readily. When cooled for a few minutes, it will stand handling very well.

For colored finishes, the wood may require a preliminary staining. Use a water stain or a non-grain-raising stain, and do not neglect a light scuff sanding after it is dry, even in the case of the latter type. For color work, the wax must be tinted, whether the wood is stained or not. A very striking soft-tone coloring is obtained by using a colored wax only on the white wood. Deeper tones, or a distinct colored effect, will require staining of the wood also.—W. T. SMITH.

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EDITORIAL

Air-Drying Wrinkle Available

After publishing several readers' inquiries for an air-drying wrinkle finish, we are pleased to report receipt of a letter from a well known finish manufacturer whose sales manager says:

"We have an air-drying wrinkle finish that really does a better job than any other air-dry wrinkle finish that I have ever seen and we might be of some assistance to this company by calling it to their attention."

As every reader probably knows, many concerns are in position to supply wrinkle finishes of the baking type—those requiring an oven bake—but a reasonably satisfactory air-dry wrinkle has been difficult to find.

Training Industrial Employes

In stepping up production to handle unusual demands from certain domestic and foreign markets, a number of industries today are faced with a serious shortage of skilled labor. To meet this situation management must find some way to train men quickly.

Experience from the last World War period showed that shortcuts in training are incompatible with production efficiency and product integrity. As then, management today believes that the only satisfactory answer is to refine or streamline the training methods, cut all waste and lost motion, and in general step up the tempo without sacrificing the essentials of good training. The details of how industry is doing this are given in a new report, *Intensive Training of Industrial Employes*, issued by the Policyholders Service Bureau of the Metropolitan Life Insurance Co.

The report points out that some of the initial steps to be taken in meeting this problem include accurate determination of a company's labor requirements, careful analysis of the employe's qualifications coupled with proper placement, and better organization of labor sources. Reorganization of the skilled man's job, separating the less skilled phases of the work for which new men can be more quickly trained, has proved effective in speeding up

the training. Another approach is to improve the quality of the training by carefully meshing the essential training material with a detailed analysis of the production job. Individualizing the training as much as possible so as to give each employe the minimum instruction needed has been found much less wasteful than a program based on average ability.

These are but a few of the devices that industry is employing to meet the emergency problem of training for skilled jobs as disclosed in the Metropolitan's study. Copies of the report are available from the Policyholders Service Bureau, Metropolitan Life Insurance Co., One Madison Ave., New York, N. Y.

Business, the War and You

Mr. James T. Buckley, President of Philco Corp., speaking in Chicago, Ill., at the annual convention of 800 distributors and officials of the company, expressed the sentiment, we believe, of many sound business executives in America when he declared:

"General industry in the United States is bound to be greatly stimulated by the armament program.

"Do not give way to the temporary ups and downs of public sentiment. Do not become a party to war hysteria; think things through; keep your eye on fundamental factors affecting business conditions, for they are what count.

"We should not permit our time and energies to be consumed in useless worrying and discussion about foreign developments. If you can do anything to make the position of the United States safer and stronger, by all means do it. Keep informed, but devote your time and energies to attending to business and in this way make a contribution to the general welfare by providing valuable goods and services.

"We can expect further engineering developments in the future as we have had in the past . . . ."

Mr. Buckley also forecast a greater demand for goods and rising raw material prices.

Flock Finish Attracts New Prospects

Among the several recent inquiries for information about flock finishes, one comes from a western machinery manufacturer and dealer. This company is asking about flock because one of its customers—an aircraft manufacturer—is interested. The prospective purchaser of flock desires certain specific information about the material before deciding to use it. For example, the company wants to know if or how well it will serve as a sound deadener; whether it can be treated to make it flameproof or fire resistant without harm to the flock; whether ageing or corrosion of the aircraft metal to be covered with flock will cause the flock binder to loosen, etc.

This is just another instance of how certain finishing materials are being investigated for their possible and prospective adaptability for uses that are perhaps entirely new to the manufacturer, but which may create markets for tremendous quantities of the material. It emphasizes the value of having complete facts about

the merits and adaptability of ones products and of publicizing some of this data in INDUSTRIAL FINISHING magazine. Individuals and concerns seeking facts about finishing materials and related supplies or equipment direct their inquiries to INDUSTRIAL FINISHING, which is the acknowledged international source of information of this character.

How and Why the Finish Can Make or Break Furniture Sales

* We have stressed finishing from the standpoint of what to use and how to use it; from the cost of material angle and how much the coverage is per gallon; and from other angles peculiar to finishing room practice. We have discussed and studied finishes as protective and decorative coatings for whatever we are making; we have looked at the results with a critical eye, but always we have looked at it from the standpoint of the manufacturer. We have something to sell. We have prettied it up so that it is pleasing to the eye. It has sales appeal.

Let us assume now the role of purchaser. I am a lady about to purchase a new piece of furniture. The stand I have had in my living room is outmoded and it is time that I am buying a new one. I speak to my husband about it and he says:

"Yes you better get a new one; I'm tired of looking at that old stand myself. It has stood up well, but it's out of style now. Look around for something new, something in good taste."

So I go to the furniture stores. A polite suave salesman approaches all smiles and attention.

"Something for you madam?" he inquiries.

"Why yes. I'd like to look at some stands; living room stands."

"Right this way madam."

He leads me to the department where stands are on display and turns to me still smiling.

"Something in walnut madam? Or perhaps mahogany? Maybe you prefer the lighter colored woods. Now here is a beautiful stand in natural maple. Curly effect."

I listen to his sales talk; feel the texture of the various pieces he shows me; examine them closely as I go from stand to stand. Pretty soon I find one that catches my eye. It has a round top and four straight double square legs that are connected across the bottom to the opposite legs, forming a cross for a base. The rim under the round top is about 5-in. deep, with a double groove running clear around—about 1-in. from the top and bottom edges; the only effort at ornamentation. It is a beautiful stand; good lines, good color and it looks like walnut.

"You like that stand?" the salesman asks.

I do not answer immediately but step closer for better inspection. I touch the top; pass my hand over its surface; then lean down to observe the finish. The salesman hovers near as I straighten up and pass on. I have a disappointed feeling all over; I

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* Guest Editorial .... Many readers can write an excellent editorial — two or three paragraphs presenting a timely suggestion or valuable idea that will stimulate thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

thank the salesman and leave the store. My afternoon is spoiled; I hurry home, visions of that stand still in by mind.

"You'd think", I say to my husband that evening, "that furniture manufacturers would be more careful about their finishing."

"What now?" he says, "didn't you find a stand?"

"That's just it," I declared, "I did, but oh my, the finish. It was a beautiful stand, just what I wanted but . . . ."

Here's why the lady didn't purchase. The top wasn't smooth and she found several blotches on the side where the finisher had made a bad job and let it go. Dirt had evidently gotten into the finish, too, before it dried. The design had caught the lady's eye. She wanted that stand to the exclusion of all others; but her discerning eye had detected some seemingly minor faults that the finishing department had overlooked. Result: No sale.

Careful inspection is part of the finshing game. Inspect every article before okaying it. Look at it from the purchaser's viewpoint. Whether it's high-priced or low-priced furniture, good finishing pays. It makes satisfied customers, and satisfied customers make good business. — W. K. PERDUE.

Choice of Color Adds Value to Products

* Public fancy for color undergoes change more than twice a year. Colors that sell today are determined by watching and registering the stream of indications that are flowing from all sources: Advertising, dress fashions, movies, fabrics and art.

The public expects change and shows its appreciation for that which is novel and interesting by increased buying interest. For this reason new color distribution, enlivening designs and lay-outs in keeping with present public preferences for certain well-chosen colors are proving potent magnets for consumers' dollars.

Any color treatment that com-

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NALCO DRITHERM
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mands unusual admiration will be found to be in accord with the few laws which regulate the distribution of color in nature. It will excel in the degree that it possesses fitness, proportion, harmony and the repose that the ultimate result produces in the eyes of observers. The secret of success in all color work is the production of a broad general effect by the repetition of a few simple colors. Variety of this nature, rather than multiplicity of colors and varied forms, is the goal of color engineering.

It costs no more to use scientifically selected, psychologically correct colors than it does to continue outmoded color styles. The public reacts favorably to that which is new, stimulating, and suitable.

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PRODUCTION PROVEN

— FINISHES —

Finishing systems scientifically developed to meet your specific conditions will (1) Cut finishing cost per unit (2) Save time by reducing the number of finishing operations.

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HOT LACQUER UNIT

Complete with circulating pump, thermostat, thermometer, pressure maintaining valve, gauges, and control switches; fully automatic. Portable.

Send for literature.

M. & E. MANUFACTURING CO.
720 S. Meridian St., Indianapolis, Ind.

Here is a typical instance that gives striking evidence of color's power. Two identical tools were supplied to a certain manufacturer. One was left with the usual shop coat of paint but the other was finished in colors to facilitate its operation. Controls received identifying colors; pedestals were painted in light-reflecting colors; working areas were painted to assure maximum visibility. Two years later, during an inventory by disinterested engineers, the regularly-finished tool was given the usual depreciation rating while the other was valued at $500 more than its less colorful companion. Operators had taken extra pride in its appearance. They took better care of its maintenance and working parts. Output superiority made it more valuable.—HOWARD KETCHAM.

Letters from I. F. Readers

(Continued from page 10)

Film Scrap

Several months ago we wrote and asked if you could supply us with the name of a firm dealing in scrap film. You very kindly submitted the name of one concern. Upon obtaining this information we promptly wrote for samples, and when our tests were complete, we ordered a small amount of the material. This has been about six or eight weeks ago and as yet we have had no reply to our order, a subsequent letter, nor to a night letter. Now our problem is to obtain the name of some other firm, dealing in this scrap film, that would be able to supply us more promptly. Can you help us out again? We would very much appreciate this favor.—B. L. & C.

Another source of supply has been suggested.—ED.

Bleaching Material

We are interested in procuring a bleach for mahogany veneer and are wondering whether you would be in position to furnish us with the names

It's Here!
the new "Protecto Ray"
a totally enclosed unit employing 10¼" 24 karat gold-plated reflector, recommended for use in locations where dust, paint fumes, oil, etc., are likely to collect
ENGINEERED INSTALLATIONS FULLY GUARANTEED.
INFRA-RED-RAY DEVICES, INC.—The First to Sell Such Equipment
9325 E. Forest Avenue DETROIT, MICHIGAN

of those concerns which you feel have developed the more satisfactory product.—O. Furn. Works.

Satisfactory bleaches are advertised in INDUSTRIAL FINISHING magazine.—ED.

Solvent Reclaiming

We would appreciate it if you would refer us to a manufacturer of reclaiming stills. Our paint department has suggested to us that we could reclaim considerable thinner and other solvents if we possessed a still for reclaiming used solvents and thinners.—W. R. Co. (Flow Registers).

Stripping Compounds

We note, on page 8 of your May 1940 issue, a request that you supply the D.K.Co. (The House of Mirrors) with the names of manufacturers of stripping compounds. Would you please be kind enough to supply us with the same information?—T. P. (Bridge Tables).

Information given.—ED.

Flock Finish

We will appreciate any information you can give us regarding flocking. We are interested in having metal covers flocked. Any information you can give us along these lines will be greatly appreciated.—U. S. I. (Vanity Cases).

Information supplied.—ED.

Color Forecasts

In your publication, INDUSTRIAL FINISHING you mentioned a news release on Fall Woolen Colors by the Textile Color Card Association. We would like very much to get the complete news release and would appreciate your advice as to where this may be obtained.—X. Mfg. Co.

D. C. RUBBING COMPOUND
For hand rubbing lacquer finished surfaces rapidly and economically. Use it on high-grade lacquered surfaces, and note the difference. Sold in 1 and 5 gallon cans, and 30 and 50 gallon drums. TRY IT!
*We specialize in metal cleaners and paint stripping materials. Used by nationally-known concerns.
Let Us Solve Your Cleaning Problems
D. C. COOPER CO.
20 E. 18th STREET CHICAGO, ILL.

Their address is 200 Madison Ave., New York, N. Y.—ED.

Silk Screens

We notice an inquiry on page 9 of your June 1940 issue—a request by the S. O. Co. for information on silk screens. We would like to be placed on your mailing list to receive any information regarding same, as we are very much interested.—T. T. Co. (Precision Measuring Instruments).

Metal Coating

We are contemplating the use of metal spray gun equipment for zinc coating trash baskets, and have been referred to you. We are particularly interested, at this time, in having information as to where such equipment can be purchased and any data on its use which may be available.—Astoria Work Experience Center (N. Y. A.).

We presume you have in mind the spraying of molten zinc onto these baskets. If so, we are pleased to send you by letter a list of manufacturers of hot-metal spraying eqipment.—ED.

Ken-Wood Bleaches

Create Distinctive New Finishes

New Bulletin on Wood Bleaches

Kenneth O'Meara

Holland, Michigan

Motion Picture Reveals Information About Painting and Decorating

A new motion picture film designed to assist painting and decorating contractors in selling their services, is being shown under the auspices of local dealers by the Finishes Division of E. I. du Pont de Nemours & Co., Wilmington, Del.

The picture takes its cue from the visit of a "typical" young American couple to the Du Pont Exhibit at the New York World's Fair. Eventually the scene then shifts to the young couple's home, where the dealer introduces a painting contractor who talks about paint styling, and illustrates the proper sales approach. He emphasizes the advantages of modern finishes, pointing out how they reduce cost by greater hiding power and easier application.

The contractor then explains the new science of paint styling — the most vital factor employed by the contractor in promoting his services. He takes the mystery out of styling and, by simple drawings, demonstrates how the interior and exterior of a house may be improved by the correct use of colors. Photographs of actual work done also illustrate his point.

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EXPERIENCED MAN

Wants position as finishing foreman with casket or furniture company; or as demonstrator for industrial finishes. Can furnish good references. Address IF-806, care Industrial Finishing.

SALESMAN WANTED

For New York state, by nationally-known manufacturer of industrial lacquers and enamels. Must have successful sales record in this territory and furnish best of references. Drawing account or salary and expenses to man who qualifies. Address IF-805, care Industrial Finishing.

POSITION WANTED

As finishing foreman or finish trouble man. 20 years' experience. Age 38. Experienced in quantity production, furniture, radio cabinets and novelties; thorough knowledge of cabinet building, cleaning, assembling and scheduling; also conveyor systems. Have had charge of 300 men at one time. Will go anywhere but prefer central location. Can give best of references. Address IF-802, care Industrial Finishing.

LACQUER CHEMIST WANTED.

Experienced in formulating Lacquer Products for wood finishes. Apply by letter only. LOUISVILLE VARNISH CO., Louisville, Ky.

ARE YOU THE MAN?

We recently talked with a well-known thoroughly established Eastern manufacturer of a full line of industrial finishes who told us that he is interested in locating a good experienced man to head up their industrial sales operation. If you are interested in an interview with this manufacturer you may write us direct with the assurance that your letter will be treated with strict confidence and forwarded to this manufacturer if we judge it will be to your mutual advantage to get together for a discussion. Please include your complete record and references with your letter. Address IF-803, care Industrial Finishing.

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ALLOCATION OF BUDGETS

Programs that management will approve

What's YOUR Problem?

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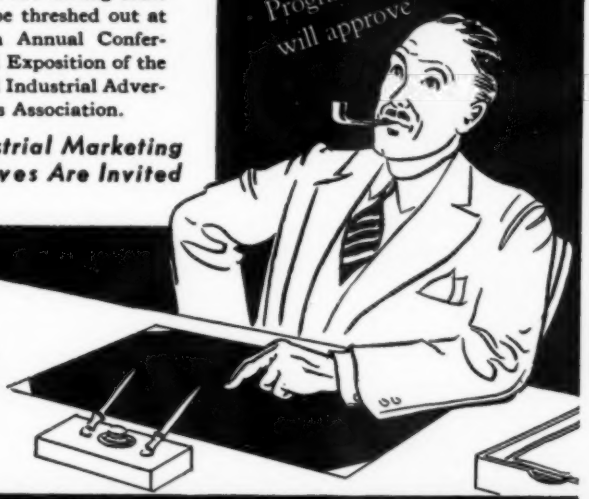
All Industrial Marketing Executives Are Invited



1940 INDUSTRIAL ADVERTISING CONFERENCE

DETROIT . . . HOTEL STATLER . . . SEPTEMBER 18, 19, 20

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TRY THIS KNIFE HEATER FOR 30 DAYS— FREE

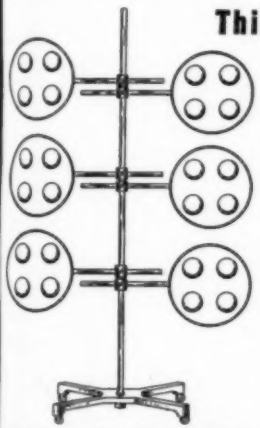
You'll find it Saves Time and Cuts Finishing Costs

That's why The Rider Furniture Co. of Monticello, Indiana, uses 32 OP-AL knife heaters in connection with the finishing of their radio cabinets . . . and also why concerns like Mengel Body and Adler Manufacturing Co. of Louisville, Kentucky, have 75 to 100 each.

Current consumption is less than 5 cents per day if used continuously all day. Positively guaranteed against overheating . . . even if current is left on continuously (day and night) it will not burn out. ***Mail Business Reply Card today for one on 30-days free trial.***

OP-AL ELECTRIC & MANUFACTURING COMPANY, INDIANAPOLIS, INDIANA

This PORTABLE BAKING LAMP Unit



As many as six 4-lamp reflectors can be placed on the one portable stand and adjusted to any position desired for the spot baking of a freshly repaired finish.

is designed primarily for baking or quickly drying high-heat enamels on touch-up repair jobs. Pictured at the right is a 1000-watt assembly (four 250-watt R-40 reflector drying bulbs), mounted on an adjustable horizontal arm supported by a tall slender pedestal which is fastened rigidly to an X-frame base that has four ball-bearing casters. The horizontal bar is adjustable vertically from a point close to the floor to as high as 6-ft. above the floor. The 4-lamp reflector can be tilted on the bar to any possible angle required.

From one to six of these 1000-watt units can be mounted on a single vertical pedestal as shown at the left. Each unit is supplied with a 12-ft. cord and plug, with switch control placed in the rear of the housing. These units are available from stock, wired for 110-120-volts and 220-240-volts. . . . The portable unit, fitted with one or several reflector lamp units, is convenient for baking spot repair finishes on automobile bodies, metal cabinets of all kinds and various other types of work having either smooth or wrinkle enamel finishes. We also have "Infra" strips for bank and conveyor assembly.

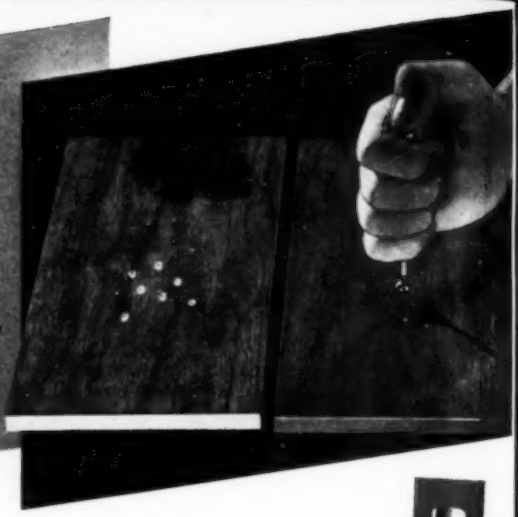
Showing one 4-lamp reflector unit mounted on the portable pedestal.

OP-AL ELECTRIC & MFG. CO.

INDIANAPOLIS, INDIANA

22 lbs. ON THE BALL!

Zapon's "impact test" for finishes



Complicated machines, some of them costly, are used in laboratories to determine how a finish will stand up under blows and rough handling to be met in actual use. Now Zapon makes another contribution to better finishing materials and methods in its new "impact test", with the ball punch.

In this simple but effective test the ball punch is pressed against the finished panel and the self contained spring gives a sharp, 22 pound blow to the ball. The test is quickly and easily made. The controlled impact can be accurately reproduced.

As the above photo shows, the difference in brittleness, flexibility and anchorage of the finish film is readily indicated. The left panel shows the spots where the impact of the ball definitely broke the finish. On the right, a Zaponite finish is unbroken, though the wood is dented.

There is a wide variety of Zaponite finishes, for example Desk Top Finish, that stand this impact test.

Write for information about how Zapon's impact test and our family of Zaponite Wood Finishes can help you.

Zaponite—Reg. U. S. Pat. Off.

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Stamford, Conn.

ZAPON
REG. U. S. PAT. OFF.

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INDUSTRIAL FINISHES